

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

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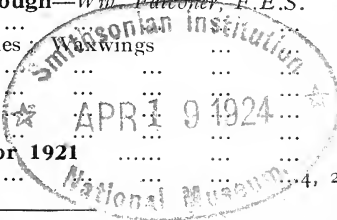
JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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Geol. Soc. Quarterly Journal. Parts 5 and 7.
Geological Magazine, 1894.
Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
Illustrated Scientific News. 1902-4. (Set).
Journ. Micrology and Nat. Hist. Mirror. 1914—
Keighley Naturalists' Society Journal. 4to. Part 1.
Kendal Entomological Soc. 3rd Report.
York Nat. Union Trans. Part 1.
Zoologist, February, 1905.

Apply—Editor, The Museum, Hull.

THE NATURALIST

FOR 1922.

NOTES AND COMMENTS.

A SHEFFIELD GRIEVANCE.

Our sympathy certainly goes to our colleague at the Sheffield Museum, Mr. E. Howarth. Some little time ago he had to part with a fine collection of silver found in Sheffield, which was claimed by the Government, and was distributed to various museums; and now he has lost a White-tailed Eagle (which has already been referred to in *The Naturalist*) which was shot by Lord Talbot's keeper. In shooting this rare bird, after attempts had been made by the Royal Society for the Protection of Birds, and by the Yorkshire Wild Birds Protection Committee, and by others, to preserve it, the keeper committed an offence against the law, and the Bench ordered the confiscation of the bird and its deposit in the Derby Museum, the bird having been shot in that county. Mr. Howarth, in a long letter to *The Sheffield Telegraph*, quite unnecessarily criticises the 'Wild Birds Protection Society' for its action, which was quite a proper one, and has the support of all Yorkshire Naturalists. Mr. Howarth endeavours to suggest that the shooting of the bird was necessary, as it had practically cleared the moors of game, and was shot while devouring a sheep! This point is quite a new feature in the life-history of this species, unless, of course, the sheep was 'planted' in order to secure an easy shot! Possibly Lord Talbot had his own reasons for sending the bird to Sheffield after the Justices had decided that it should go to Derby; but whatever those reasons were, we feel that we can hardly be surprised at the action of the Justices in announcing that it should go to the Museum in the county in which it was destroyed.

GOLDEN EAGLES.

All this, of course, is very annoying to Sheffield and its Curator. In his general account, under the head of 'Wild Birds,' Mr. Howarth makes some extraordinary statements. He refers to the difference between the Golden Eagle and the White-tailed Eagle, and then makes the startling announcement 'no Golden Eagle has visited England for sixty years.' How it is possible to make such a statement as this, it is difficult to understand, as a reference to Nelson's 'Birds of Yorkshire,' published by the Yorkshire Naturalists' Union, would have indicated that the Golden Eagle has visited

Yorkshire quite recently; and similarly *The Naturalist* could have prevented Mr. Howarth from making such a statement had he consulted it; and we know that he reads it, because we occasionally hear from him on matters mentioned therein.

A BRONZE AXE.

On the same page of the same paper we notice a lengthy article 'In Prehistoric Times: Discovery of Bronze Axe at Grindleford,' in which the writer gives evidence of a fertile imagination. We are informed that the discovery, of course, is 'of special interest and importance,' and that 'it may assist in defining the site of the ancient ford across the Derwent in Bronze Age times,' though how this assistance is going to be given is not apparent. Similarly we learn that 'most likely the Bronze Axe was lost by some enterprising trader in these commodities when negotiating the muddy approach to the ford, and there it has remained securely hidden for perhaps 3,500 years or more.' While this sort of thing is going on, we should much have preferred reading that some monster chased a Bronze Age man and ate him up, axe and all, and eventually died whilst trying to reach the Derwent for a drink. Surely a few bones could have been found in the district to have lent colour to such a theory? After a general discourse on the evolution of the Bronze Age axe, we are informed that the present axe is 'unusually symmetrical in shape' (though this is not borne out by the illustration), and that the moulds have fitted 'perfectly' together; which we believe was the habit of moulds for Bronze Age axes.

PREHISTORIANS.

The Proceedings of the Prehistoric Society of East Anglia, Vol. III., Part 3, recently issued, contain the usual wealth of illustrations, in connexion with the various papers dealing with Eoliths, Excavations at Mildenhall; Humanly-fashioned Flints beneath the Red Crag; Fauna of Grime's Graves, and the now familiar flint-crust engravings from the same source; Hammerstones, and an interesting little discussion on Flint Fractures; an alleged 'Animistic' Implement from the 'Cissbury' site, in Norfolk, which is figured and supposed to represent 'The head of an animal most nearly resembling Bos,' on which five short scratches on the forehead are said to 'produce the appearance of hair.' Judging from the illustration, it seems obvious that the alleged Bos-head is purely imaginary, and the man who used the implement probably never knew it was there.

LIVERPOOL BIOLOGISTS.

The Proceedings and Transactions of the Liverpool Biological Society, Vol. XXXV., is approaching its old standard, and is therefore issued at a guinea. It is worth it. Besides an

admirable Memoir (No. XXIV.) on 'Aplysia,' by Nellie B. Eales, there is Prof. P. G. H. Boswell's Presidential Address on 'Sedimentation, Environment, and Evolution in Past Ages'; Prof. W. A. Herdman's valuable Report on the Year's Work at Port Erin; Notes on Dinoflagellates and the Discolouration of Sands, by E. Catherine Herdman; Experiments on the Water Vascular System of Echinus, by Ruth Bamber; On the Inheritance of Coat Colour in the Varieties of *Rattus rattus*, by J. W. Cutmore; and an admirable Report on the Lancashire Sea-Fisheries Laboratory at Liverpool, with many scholarly contributions by various contributors, edited by Prof. James Johnstone.

WEST CUMBERLAND ROCKS.

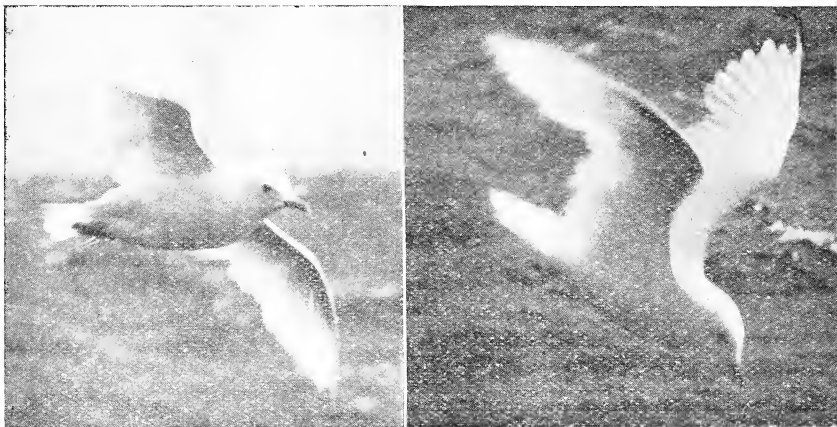
At a recent meeting of the Geological Society of London, Mr. K. W. Earle read a paper on 'The Lower Carboniferous Rocks of West Cumberland.' In the course of this paper the zonal sequence of the Carboniferous rocks is traced into Cumberland, the local variations from the type-district are noted, and comparison made with other areas. The thinning-out of the zones, when traced northwards from Shap, becomes still more marked north of the River Eamont, until it is found that, in the northern and western parts of the area described, the lowest beds resting against the Lake-District massif (partly in the faulted, but largely in unconformable junction) belong to the *Nematophyllum-minus* sub-zone. The only outlier of Carboniferous Limestone within the massif itself consists at the base of beds of that zone.

LAKE DISTRICT AN ISLAND.

These facts, and a consideration of the radial dip, which, even if constant across the crest of the dome, would be little more than sufficient to carry beds of D_1 age over the present summit of Carrock Fell (or pre-Bala age), lead to the conclusion that the Lake-District massif was an island in earliest Carboniferous times, and that complete submergence did not take place until D_1 times. The irregular distribution and thickness, the constituent materials, and the high angle of dip of the Polygenetic Conglomerate beneath the gently-dipping limestones, tend to confirm the conclusions of other writers as to its Devonian age, while note is made of the absence of any true basal Carboniferous Conglomerate. The transgression of the Orebank Sandstone across the faunal zones is compared with the transgression of the Orton-Ashfell Sandstone in the Westmorland area. Comment is made on the variability of the Millstone Grit in thickness, in composition, and in stratigraphical horizon in various parts of the area, and the valuable iron-ore deposits in the limestone series near Whitehaven are noticed.

WHITE KITTIWAKE.

Referring to the note in *The Naturalist* for November, 1921, p. 364, three photographs of this bird by S. H. Smith,



were reproduced in *Country Life*, No. 1292, recently; and by the kindness of the editor of that journal we are able to reproduce the illustrations herewith. The bird was photographed in Bridlington Bay.

NORTHUMBERLAND NATURALISTS.

We are glad to see that the 'Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne, Vol. V., part 2,' is quite up to its pre-war standard. There are

over 200 pages, and in addition to the Reports of the Field Meetings from 1915, and the Reports of the Society from 1915 to 1919, and obituary notices of G. A. L. Lebour and A. M. Norman, there are papers on 'The Siphonaptera (Fleas) of Northumberland and Durham,' by R. S. Bagnall, and an admirable and well illustrated memoir on 'The Genus *Rosa*: its Hybridology and other Genetical Problems,' by J. W. H. Harrison. Altogether, it is a creditable publication, and the editor adheres to his area.

THE PEARL'S PECULIARITIES.

Pearls are easily the most mysterious of all jewels (writes *The Manchester Guardian*—quoted in *The Queensland Government Mining Journal*). Their method of growth is unique among jewels; their capture involves something more romantic than the ordinary ways of procuring precious stones. This flavour of the unusual may account for the extravagances associated with their history—the great pearl which Cleopatra dissolved that she might drink Anthony's health becomingly, and the later imitation told of Sir Thomas Gresham at his feast for Queen Elizabeth—'Here fifteen thousand pounds at one clap goes; Instead of sugar, Gresham drinks the pearl Unto his queen and mistress.' Curious, too, is the pearl's insistence on light and air; its demand to be worn by its owners. It may be recalled how lovingly Disraeli dwelt on this peculiarity in 'Lothair' when the hero goes to Bond Street to look at pearls, and is instructed by Mr. Ruby; 'Pearls are troublesome property, my Lord. They require great care; they want both air and exercise.' And he goes on to explain how he himself looked after the pearls of the Duchess of Havant; how he bids the Duchess wear them whenever she can, even at breakfast; 'and her grace follows my advice; she does wear them at breakfast.' But this, it seems, is not enough, and Mr. Ruby goes down every year to Havant Castle to see the pearls. 'And I wipe every one myself, and let them lie on a sunny bank in the garden in a westerly wind for hours and days together. Their complexion would have been ruined had it not been for this treatment.' Whatever the value of this advice, Disraeli himself practised what he made Mr. Ruby preach. His bringing out of his wife's pearls and laying them on the grass by the terrace at Hughenden was a custom well known to his visitors.

THE RHODESIAN SKULL.

In *Nature*, No. 2716, Dr. A. Smith Woodward figures and describes the skull of 'A New Cave Man from Rhodesia.' He states that although the new skull from the Rhodesian cave so much resembles that of Neanderthal man, the shape of the brain-case and the position of the foramen magnum are

so different that we may hesitate to refer the two skulls to the same race. This hesitation seems to be justified when the associated limb-bones are considered, for the tibia is long and slender, of the typically modern type, and the extremities of the femur do not differ in any essential respect from the corresponding parts of a tall and robust modern man. They are thus very different from the tibia and femur of Neanderthal man found in the caves of Belgium and France. As the skull appears to postulate an erect attitude, the congruous limb-bones may well be referred to it. We therefore recognise in the Rhodesian cave man a new form which may be regarded as specifically distinct from *Homo neanderthalensis*, and may be appropriately named *Homo rhodesiensis*. The precise systematic position of this new species of primitive man can be determined only by further discoveries. It has, however, been pointed out by Prof. Elliot Smith that the refinement of the face was probably the last step in the evolution of the human frame. The newly discovered Rhodesian man may therefore revive the idea that Neanderthal man is truly an ancestor of *Homo sapiens*; for *Homo rhodesiensis* retains an almost Neanderthal face in association with a more modern brain-case and up-to-date skeleton. He may prove to be the next grade after Neanderthal in the ascending series.

AN OLD GEOLOGICAL 'SECTION.'

At a recent meeting of the Linnean Society of London, the President, Dr. A. Smith Woodward, remarked upon a representation of a section of Derbyshire from East to West, executed in samples of the respective rocks by Mr. White Watson, who was elected a Fellow in 1795, and whose death was reported at the Anniversary Meeting of 1837. He was connected with the Post Office and the dispatch of the mails, and in 1794 he prepared the representation above mentioned, issuing also a pamphlet descriptive of it. The British Museum possesses the pamphlet, but not the tablet here shown, which measures 19" by 13". As the tablet is somewhat remote from the pursuits of the Linnean Society, the Council has suggested that it would be appropriate to transfer it to the Trustees of the British Museum. It was given to the Society on the 24th May, 1810. This suggestion was adopted.

ROCKS AND FOSSILS.*

This little book consists of a number of photographs with more or less appropriate descriptions; but so far as the fossils are concerned the title should be 'How *not* to identify them!' On page 31 is a photograph described as 'Flinty Shell Remains of Foraminifera'; they are not 'flinty shell

* 'Rocks and Fossils, and how to Identify them,' by J. H. Crabtree. The Epworth Press, 63 pp., 1s. 9d. net.

remains.' The ammonite figured on page 45, said to be 'filled with chalk,' is certainly not filled with chalk. In other instances the same fossil is photographed on different plates, and is used to illustrate different divisions. For instance, 'Fern-print from the coal beds,' on page 45, also appears as 'Pecopteris' among fossils in 'Permian and Triassic Rocks' on page 55! Similarly a curious object described as 'Lepidodendron,' and appearing among the fossils in 'Old Red Sandstone' on page 51, also does duty as a fossil in the 'Permian and Triassic Rocks' on page 54, though *Lepidodendron* is typical of neither! Again, the object described as a 'Spirifera' in 'Old Red Sandstone' apparently also appears as 'Spirifer' in 'Permian and Triassic rocks,' 'Spirifer' in 'Oolite and Lias,' and so on; and we defy anyone to guess what the object described as 'Head of a stone celt' is, on page 63. Mr. Crabtree may or may not be an excellent photographer, but we cannot look to him for guidance in identifying fossils.

ANOTHER GEM.

Speaking of 'The Ice Age and After,' Mr. Crabtree amuses us:—'Our Island formed part of the European mainland; and the mammals that traversed the whole continent were much like those of existing genera. Some have become extinct during the million years that have intervened since the "Ice Age," these include the mammoth, Irish deer (*sic*) dodo. (*sic*), and *dinornis* (*sic*), a large bird. Other animals have migrated to farther climes.' Thanks be! Oddly enough, this book dealing with 'Rocks and Fossils' has a modern coral (which is neither) on the front cover!

CUCKOO FILMED.

We learn from *Nature* that 'A very remarkable kinematograph film, illustrating the method by which the cuckoo disposes of its eggs, and the subsequent behaviour of the young, was exhibited at the scientific meeting of the Zoological Society held recently. For some years these matters have formed the subject of very patient and methodical study by Mr. Edgar Chance, and this summer he contrived, after an elaborately worked out plan, to summarise his results with the aid of a kinematographer carefully concealed within the shelter of leaves and bracken. Hitherto it has been the accepted belief that the cuckoo deposited her egg upon the ground and then conveyed it to the nest of her dupe in her beak. This film showed clearly enough that, as a matter of fact, the bird lays the egg within the nest, which, at any rate in the case of meadow-pipits' nests, she leaves tail foremost, apparently to avoid displacing the "run" made by the owners of the nest. As she leaves she takes in her beak one of the

eggs of the pipit, and presently eats it. The "planing" down of the cuckoo from a high tree, and the alighting within a few feet of the nest, were most realistically shown.'

UNNATURAL 'NATURE.'

'But the most wonderful of the whole series of pictures were those which showed the young cuckoo, though but two days old, blind, and naked, making the most determined efforts to raise its foster-brothers on to its back and up over the edge of the nest, thrusting its lean limbs backwards to assure itself by the sense of touch whether its efforts had succeeded. There was something indescribably diabolical and horrible about the whole of the proceedings. The first attempt failed, the downy, struggling body of the nestling to be ejected being saved from falling over the edge of the nest by a projecting twig. At this juncture the foster-mother returned and, unconcernedly feeding both her own youngster, gasping on the rim of the nest, and the young cuckoo, took both and brooded them. No sooner had she left them for more food than the work of eviction began afresh, and this time was accomplished successfully. Immediately after the only remaining rival was also thrown out.'

SHAP GRANITE.

In an article on 'The Stones of London,' by J. V. Elsdon and J. A. Howe, in *The Quarry*, we learn that 'The Shap granite, quarried at Wasdale Crag, Westmorland, is a conspicuous feature in the decorative architecture of London streets. This granite is readily recognised by the characteristic large crystals of pink felspar, in rectangular sections scattered through a matrix of smaller felspars, dark mica and quartz. There are two shades, dark and light, differing chiefly in the colour of the ground mass. The stone may be seen in the polished facades of many buildings. Amongst these may be mentioned the Midland Railway Station and Hotel, St. Pancras; Grand Hotel, Charing Cross; Holborn Restaurant; Mercers' Hall, Poultry; and many others. Shap granite forms the material for the polished stone posts round St. Paul's Cathedral, and it was used in the Temple Bar Memorial. It was employed also in the Prince Consort Memorial, Hyde Park; the Palmerston Memorial, Palace Yard; and elsewhere. Shap granite had an extensive vogue in the late Victorian architecture of London streets. It is most effective in polished columns and pilasters, which may be seen of considerable size. It looks well in combination with other varieties of polished granite of different shades and colour, and even in less conspicuous uses its decorative effect may be noticed in many of the business thoroughfares.'

STATICE LIMONIUM ON THE NORTH BANK OF THE HUMBER.

T. PETCH, B.A., B.Sc.

IN 1901, the finding of a panicle of *Statice Limonium* on the Holderness coast led the writer to search for that plant on the Yorkshire side of the Humber. At that time there were old records of *Statice Limonium* for the East Riding, but local botanists were not acquainted with it as an East Riding plant. A note on its prevalence on the Humber shore was published in *The Transactions of the Hull Scientific Club* for 1901 (p. 234), and further investigations were made during the next three years. My departure from the country put an end to these before much had resulted which warranted publication. One or two points, however, emerged, which have not been subsequently noted; and it is possible that these may prove of interest. The record, too, of the distribution of *Statice* on the Holderness coast in 1901-04, may prove useful for comparison with later conditions.

To understand the distribution of *Statice* on the north bank of the Humber, and the varying descriptions which have been given from time to time of that foreshore, it must be remembered that with the exception of a short distance at Paull, where the Humber cuts into the morainic hill there, the whole of the land bordering the Humber between Hull and Kilnsea is reclaimed land, and the tidal water is kept from overflowing the country by an artificial bank, maintained at a height, I believe, of 17 ft. O.D. From Hull to Cherry Cob Sands the bank is an ancient one (except, perhaps, at Saltend Common). Then comes Cherry Cob Sands, a reclamation of 1770; and that is immediately succeeded by Sunk Island, the last part of which was enclosed about 1897. From Welwick to Easington the bank is again an ancient one.

In reclaiming land, both on the Humber and the Wash, the old practice was to enclose saltmarsh or 'growths' only. The reclaimer watched the foreshore gradually silt up until it grew Marsh Samphire, Aster, Sea Lavender, and Atriplex, and finally attained such a height that the part nearest the mainland became pasture (outstray), only submerged at the highest spring tides. It was a slow business; fifty years elapsed between the last two reclamations on Sunk Island, and nearly the same length of time between the last two on the eastern side of the Wash. It was an axiom that it did not pay to enclose bare mud. Newly-enclosed land usually consisted over at least half its area of grass-land—salt pasture—while the remainder was well-grown saltmarsh.

The artificial bank was usually made straight for as long

a distance as possible. That involved a process of give and take, a piece of saltmarsh being left outside the bank in one spot, and an area of bare mud enclosed in another; and as bare mud was not wanted, the balance was in favour of the saltmarsh. This has been particularly noticeable on the Humber shore, east of Paull, where the majority of the recent enclosures have been long-triangular—the apex of the triangle lying towards Hull, and the two long sides of the triangle being the old and the new banks respectively. But the saltmarsh has usually grown up with a frontage curved outwards towards the main channel. Hence the construction of a straight bank has left a part of the saltmarsh outside in the shape of a segment of a circle (*e.g.*, Cherry Cob Sands). An attempt was made to avoid this when the last bank on Sunk Island was built, and the foundation of the bank was laid in a straight line from the western end near the edge of the saltmarsh. But the extreme south-east corner of the enclosure was a large area of bare mud and had to be abandoned.

It will be evident that when conditions have settled down after an enclosure, the region bordering the river should consist of an artificial bank, from which one descends to a strip, usually narrow, of saltmarsh, which passes gradually, without any abrupt alteration of level, into the bare mud which is submerged at every tide. Given favourable conditions, the saltmarsh gradually extends outwards, its level near the bank rises, and in time another area is ripe for enclosure.

On the north shore of the Humber, however, between Hull and Spurn, the state described in the foregoing paragraph existed, in 1900-1904, only at a few points. One gained the impression that over the greater part of that length the limit of reclamation had been reached. Except along the last addition to Sunk Island from Hawkins Point to Welwick, not only was there no accretion, but erosion had occurred since the construction of the bank. In some places, *e.g.*, at Saltend, this had been so serious that it had been necessary to protect the bank by facing it with timber, with a backing of chalk. In others, especially where extensive outstrays existed, the true saltmarsh had been eroded, so that the foreshore passed from salt pasture to bare mud with an abrupt fall, in some cases a vertical cliff up to four feet in height.

The condition last described was typical in 1900 of the greater part of the north bank of the Humber from Hull to Easington. Whether the cliff has in all cases originated by the erosion of a fringing saltmarsh it is not possible to say, but there does not appear to be any other feasible explanation of it. In a few places, *e.g.*, at Marfleet, Cherry Cob Sands and Stone Creek, the grassy area between bank and cliff formed

an extensive outstray, the largest being that at Cherry Cob Sands, which was several hundred yards wide opposite Sands House. But over the greater part of the distance it was reduced to a narrow strip only a yard or two wide. The cliff varied in height from about four feet to a few inches, but even in the latter cases there was no fringing saltmarsh. At some points the artificial bank descended directly to the bare mud.

True saltmarsh existed in 1900-04 on the north shore of the Humber, east of Hull, only in the following localities:— (1) as a narrow strip along either bank of Hedon Haven; (2) a small patch at Paull Holme; (3) a narrow strip up to ten yards wide, along Sunk Island, chiefly along the new bank; (4) a rectangular patch, immediately east of Patrington Haven. The third locality was principally the piece of saltmarsh left when the last reclamation was made (1897). Locality number 4 deserves special explanation, as it is the headquarters of *Statice Limonium* on the Humber shore. The last reclamation extended along the west side of Patrington Haven Channel further south than the reclaimed land on the east side. The bank of the latter ran from the Haven Channel at right angles for a short distance, and then turned southwards past Welwick. Thus, between the old and the new banks there was a rectangular area, forming a sheltered corner, which should rapidly silt up. This area was described by Mr. T. Stainforth in *The Naturalist* for July, 1912.

It will be understood from the foregoing account that there is only a comparatively small area of ground, such as is usually associated with the growth of *Statice Limonium*, on the north shore of the Humber. The following account is in the main an account of the occurrences of *Statice Limonium* under abnormal conditions.

STATION A (Saltend).—This was a small outstray on the western side of the Hedon Haven mouth. The adjoining Saltend Common within the bank was then grazed, and this outstray was close-cropped by sheep, etc. The northern half was submerged only at spring tides, but was lower than the outstray at Cherry Cob Sands. Its level was estimated to be 12 ft. O.D. in 1903. Viewed from the bank, it had the appearance of a well-kept cricket pitch. I was well acquainted with this area, and had walked past it and over it on dozens of occasions for fifteen years, before discovering that a great part of the vegetation consisted of *Statice Limonium*. The plants were very small, each consisting of two or three leaves, spread out flat on the ground. They did not show any signs of injury due to grazing. The length of the leaves varied from 2 cm. to 4.5 cm.; the breadth from 0.7 cm. to 1.5 cm.,

and the thickness from 320 to 330 μ . The average length was 3.5 cm. and the breadth 0.97 cm. The 'stalk' was about one-third the total length of the leaf. All had terminal tips and a comparatively broad, scarious margin. None of the plants flowered during the three years they were under observation, 1902-1904.

In August, 1911, this outstray was in practically the same condition. The leaves of the *Statice* were, however, smaller, varying from 0.7 to 1.4 cm. in length, and 0.3 to 0.6 cm. in breadth, the average length being 1.08 cm. and the breadth 0.46 cm. Further observations on these plants are given later.

STATION B (Hedon Haven).—Hedon Haven is a narrow tidal creek, about two miles in length, which contains only a few inches of water at low tide. Along the sides, at the foot of the artificial bank, there is a narrow strip of saltmarsh, up to ten yards wide in a few places, which grows chiefly Sea Aster. About a quarter of a mile up the Haven from locality 'A,' a few plants of *Statice Limonium* occurred in 1902-04. At the point where they grew, the strip of saltmarsh and part of the bank had slipped into the Haven, so that the face of the bank descended precipitously to an area of almost bare mud. The *Statice* plants were situated at the foot of the bank, some of them with their leaves growing up among the long grass with which the bank was covered. The locality had a southerly aspect and was protected from wind. The estimated level of the plants was 8 ft. 6—9 ft. O.D.

The leaves of these plants were extraordinarily large. On a plant among grass, the leaves attained a length of 36 cm. and a breadth of 9 cm. in 1903, and a length of 43 cm. with a breadth of 6.25 cm. in 1904. An inflorescence of this plant taken in August, 1903, was 47.5 cm. high. Plants a short distance away, on the mud, had leaves up to 32.5 cm. long and 5.6 cm. broad.

The leaves of *Statice Limonium* are furnished with a tip or point in continuation of the mid-rib. On small leaves, such as those noted in locality 'A,' the tip is terminal. On the larger leaves, the tip often arises from the mid-rib a short distance below the apex, and the apex of the leaf may be hooded. On unfolded leaves, the tip may be produced into a long flagellum, but this usually breaks off when the leaf is fully expanded, leaving only a short stump. In locality 'B,' the tips on the leaves observed in 1903 were below the apex of the leaf (subterminal), and were up to 3 cm. long on unfolded leaves. In 1904, the tips were terminal or subterminal on the same plant. The thickness of the larger leaves was 440-480 μ .

(To be continued).

KEY TO THE HARPIDIROID HYPNA.

J. A. WHELDON.

(Continued from 'The Naturalist' for Oct., 1921, p. 346).

(F) WARNSTORFIA Loeske.

Stem without paraphyllia ; cortical layer not differentiated. Leaves normally serrate, alar cells enlarged forming more or less distinct auricles, or rarely the cells are uniform and auricles obsolete. Cells linear, more or less vermicular. Nerve single, rarely furcate above. Perichaetial leaves smooth. Capsule exannulate. Inflorescence dioicous or monoicous.

1. Alar cells suddenly very distinct, hyaline, inflated, usually forming conspicuous auricles : plants dioicous, usually more or less rigid : leaf base often dentate (29). Alar cells only slightly enlarged, more obscure, shorter, and forming less distinct, scarcely inflated auricles : plant usually autoicous, soft and flaccid : leaf apex usually dentate and occasionally rhizinose (4). Alar cells obsolete as in *Limprichtia* : lower margin more or less serrate, and leaf-apex occasionally producing rhizoids (2).

2. Tall and robust (10-20 cm.), brownish to yellowish-green, pinnate : leaves strongly falcate-flexuose throughout (habit of robust *H. Sendtneri*) : nerve single reaching above middle, 56 μ wide at base (*W. fluitans* var. *scotica*). Short and weak (3-10 cm.), green, hardly pinnate : nerve short, single or double (3).

3. Leaves lanceolate, distant, flexuose-spreading, nerved about half way (*W. fluitans* var. *Jeanbernati* f. *Holleri*). Leaves oblong-lanceolate, lightly homotropous, shortly decurrent : nerve often furcate, short, in rameal ones nearly obsolete (*W. fluitans* var. *hemineuron*).

4. Usually green : leaves secund or erect below, falcate at apices basal cells hardly incrassate, of uniform texture, rarely coloured : nerve rather narrow, 45-65 μ (5). Usually yellowish, to chestnut or purplish-brown, rarely green above only : basal cells incrassate, subquadrate, often yellow or orange : nerve rather stout, 60-120 μ (20).

5. Simple or slightly branched, hardly pinnate : usually rather short (6). Pinnate, often regularly and densely : usually tall and robust (17).

6. Leaves with a long or short fine subule (7). Leaves with narrowly acuminate but hardly subulate points (19).

7. Green (fawn coloured in age) : leaves flexuose below, subfalcate-secund above, strongly narrowed to base (8). Green or olive-green above, fuscous below, or rarely mingled green and vinous : leaves from a broader base, erect or patent, hardly falcate above, except in var. *squalidum* (10).

8. Slender, lax, and elongate : leaves distant, narrow, very long (9). Densely tufted, shorter, less flaccid : leaves smaller, more closely imbricate, shortly subulate, their points falcate recurved (*W. fluitans* var. *gracile* f. *abbreviata*).

9. Green, slender, slightly branched : leaves lightly curved, narrow, longly acuminate, dentate above : nerve thin (*W. fluitans* var. *gracile*). Whitish-green, very soft, flaccid, texture delicate and translucent : leaves very distant, very narrow and elongate, with extremely long filiform twisted points : basal cells lax, angular-decurrent (*W. fluitans* var. *gracile* f. *laxifolia*).

10. Leaves oblong-lanceolate, rather suddenly narrowed into a short fine subule (11). Leaves linear-lanceolate, very gradually narrowed into a long fine subule (12).

11. Dull green above, reddish-brown below : upper leaves secund-falcate, lower complanate subpatent : auricles scarcely decurrent (*W. fluitans* var. *squalida*). Pale green, stained vinous-red below : leaves straight, erect patent : auricles distinctly decurrent (*W. fluitans* var. *Payotii*).

12. Glossy slender occasionally purple stained : leaves small (under 3 mm.), densely imbricate, points only recurved : nerve short, scarcely exceeding mid-leaf : cell walls solid slightly incrassate and porose at leaf base (*W. fluitans* var. *Robertsiae*). Yellowish-green passing to red and brown : leaves larger (5-7 mm.), nerve reaching $\frac{3}{4}$: basal cells less incrassate, not porose (*W. fluitans* var. *setiforme*).

13. Stems filiform, subsimple : leaves distant horizontally patent : auricles small and obscure (*W. fluitans* var. *Jeanbernati* f. *tenella*). Stout, leaves not patent (14).

14. Leaves entire, erect, oblong, shortly acuminate : upper cells rather short, supra-basal ones lax and parenchymatous, alar cells a little dilated (*W. fluitans* var. *pseudostraminea*). Leaves more or less serrate, at least near apex (15).

15. Auricles nearly or quite obsolete, or if distinct, nerve short and often furcate (16). Auricles more distinct (18).

16. Tall and robust, pinnate : leaves strongly falcate throughout, resembling a rather robust *D. Sendtneri* : auricles obsolete (*W. fluitans* var. *scotica*). Smaller, not pinnate : leaves feebly falcate at apex only, or not at all (17).

17. Leaves distant, flexuose, finely acuminate, thinly nerved half way : nerve occ. furcate (*W. fluitans* var. *Jeanbernati* f. *Holleri*). Very small (1-3 cm.), leaves lightly homotropous, acumen short and rather obtuse, toothed : nerve short, often furcate, in rameal leaves nearly obsolete (*W. fluitans* var. *hemineuron*).

18. Auricles strongly decurrent, supra-basal cells lax : nerve 35-60 μ , plant submerged, elongate, pale green, with large (4-7 mm.) lax, flexuose or feebly falciform leaves, often patent in lower part of stems (*W. fluitans* var. *submersa*). Auricles hardly decurrent, cells nearly uniform to base : leaves closer, lower usually erect or subsecund (19).

19. Cells very long and narrow : nerve slender (46-50 μ) : dull green (20). Cells rather shorter and wider, more chlorophyllose : nerve a little stronger (52-64 μ) : bright glossy green (*W. fluitans* var. *atlantica*).

20. Leaves rather large and wide : plant tall (15-25 cm.), much divided, divisions pinnately ramulose (*W. fluitans* f. *elata*). Leaves smaller and narrower : plant (5-15 cm.) feebly branched, scarcely pinnate : nerve 46-48 μ at base (*W. fluitans* var. *Jeanbernati*).

21. Nerve comparatively weak (34-90 μ) at base : plants usually slender and rather short (22). Nerve stronger (90-120 μ) : plants typically robust and pinnate (27).

22. Very long but slender (15-25 cm.), more or less pinnate, leaves of branches plumosely spreading : leaves narrowly lanceolate, nerve weak (40-60 μ) and short, hardly exceeding middle of leaf : basal cells coloured, in one or two rows reaching nerve (*W. fluitans* var. *Delamarei*). Shorter (5-15 cm.), rarely pinnate, often subsimple (23).

23. Leaves lax, narrowly acuminate, not, or only shortly, subulate (24). Leaves dense, longer, grad. acuminate, ending in a long subulate point ; greenish-yellow above, deep chestnut below (*W. fluitans* var. *falcata* f. *alpina*).

24. Leaves grad. acuminate, from an oblong lanceolate to lanceolate base : nerve 50-60 μ wide (25). Upper leaves rather suddenly acuminate from an oval base : nerve short and weak (33-50 μ), sometimes furcate above (26).

25. Leaves regularly falcate-secund (*W. fluitans* var. *falcata*). Leaves erect, lightly appressed, hardly falcate-secund, the leaf points

alone lightly secund inclined: small, slender, fawn coloured and slightly branched, branches irregular, short (*W. fluitans* var. *falcata* f. *shetlandica*).

26. Leaves 2 mm. or more long, feebly falcate: plant larger, 5-10 cm. high (*W. fluitans* var. *ovale*). Leaves 1.5 mm. long or less, comparatively wider and shorter: plant small and slender with strongly secund-falcate leaves (*W. fluitans* var. *ovale* f. *densum*).

27. Nerve comparatively weak (85-100 μ on well developed stems): plant paler (glossy greenish-yellow to pale brown, darker below): leaves denticulate all round: auricles often rounded and projecting: texture delicate, median cells thin walled, translucent (*W. fluitans* var. *Arnelli*). Nerve stronger (100-130 μ), plant more deeply coloured: auricles less prominent: leaf texture more solid (28).

28. Leaves longly subulate: cell walls moderately incrassate (29). Leaves shortly subulate: cells with strongly thickened, coloured and interrupted walls: plant stout, 15-20 cm. high, densely pinnate, brown, soon purplish, then blackish (*W. fluitans* var. *procera*).

29. Dull yellowish-green, fuliginose below: leaves denticulate, erect-patent, weakly falciform at stem apex: pinnate above, pinnae ascending: nerve 80-130 μ (*W. fluitans* var. *anglica*). Greenish, soon purple, passing to brownish-black: leaves subentire, falciform: tall (20-25 cm.) and regularly pinnate: nerve 100-120 μ (*W. fluitans* var. *tricolor*).

30. Auricles of many thin-walled polygonal cells disposed in 3 or 4 rows (31). Auricles of fewer longer rectangular curved cells disposed in 1 or 2 rows, sometimes incrassate and coloured (39).

31. Acumen short and wide: supra-basal cells short and wide (32). Acumen longer and narrower, as also the cells (35).

32. Plant arctic: leaves small (1½-2 mm.), acumen very short, lingulate-obtuse at times subcucullate: apical cells dilated, rhomboid (*W. exannulata* var. *tundrae*). Plant montane or of the plains, without above characters (33).

33. Robust: leaves large, widely oblong oval, suddenly shortly cuspidato-acuminate, erect appressed, closely imbricate at apices of stem: nerve stout, 90-140 μ at base (*W. exannulata* var. *orthophylla*). Slender: leaves less suddenly acuminate: nerve narrower, 50-90 μ (34).

34. More or less pinnate and elongate: leaves (at least the upper ones) falcate-secund: nerve (66-90 μ) wide (*W. exannulata* var. *brachydiction*). Slightly branched, short, glossy: upper leaves erect appressed, obtuse, giving the appearance of *Calliergon stramineum* or *Acrocladium cuspidatum*: nerve 50-60 μ wide (*W. exannulata* var. *Nicholsoni*).

35. Leaves oval to oval-oblong acuminate, falcate-secund (36). Leaves from a narrower oblong lanceolate base, more longly acuminate, flexuose below, falcate-secund above: basal cells longer and also cells frequently approaching in structure those of *W. stenophylla* (*W. exannulata* var. *pinnata* f. *stenophylloides*).

36. Leaves falcate recurved (37). Leaves almost falcate circinate above, nerve very strong (38).

37. Erect, green, often tall and pinnate, nerve 90-108 μ (*W. exannulata* var. *pinnata* f. *acuta*). Procumbent, irreg. branched or nearly simple, more slender, nerve 66-70 μ (*W. exannulata* var. *pinnata* f. *gracilescens*). Robust and often blotched with purple (*W. exannulata* var. *pinnata* f. *versicolor*).

38. In large depressed patches, stems much divided, divisions irregularly pinnate, dark brown to blackish-brown below: leaves strongly hamato-secund, approaching in habit *L. revolvens* (*W. exannulata* var. *pinnata* f. *montana*). In large swelling compact silky cushions, golden green above, orange-brown below: stems repeatedly divided and proliferous, divisions with crowded fastigiata branches: leaves very dense, appressed below, subcircinate above (*W. exannulata* var. *pinnata* f. *polyclada*).

39. Nerved to base of subule or a little higher, but not percurrent : nerve percurrent or excurrent (40).

40. Leaves rather small and crowded, usually more or less purplish : nerve reddish (41). Leaves larger, 4-7 mm. long (43).

41. Densely tufted, short, with crowded branches : leaves oval, strongly falcate, crisped (*W. stenophylla* var. *purpurascens* f. *Renauldii*). Taller : leaves form an oblong-lanceolate base, more feebly falcate-secund : not crisped (42).

42. Almost entirely purpurascens (*W. stenophylla* var. *purpurascens* f. *typica*). Green, blotched with purple (*W. stenophylla* var. *purpurascens* f. *versicolor*). Entirely green above (*W. stenophylla* var. *purpurascens* f. *virescens*).

43. Nerve distinctly excurrent (44). Nerve not excurrent (46).

44. Nerve stout (80-90 μ at base), not much narrowed above, and excurrent in a short stout point : stems denuded below, and bristly with remains of leaf-nerves (*W. Rotae* var. *irrigata*). Nerve narrowed above and ending in a long fine point : nerve 80-110 μ at base (45).

45. Excurrent nerve of moderate length (*W. Rotae*). Nerve very longly excurrent as a bristle-like awn (*W. Rotae* var. *trichophylla*).

46. Nerve penetrating far into subulate point (47). Nerve ceasing in lower part of acumen, 55-70 μ at base (50).

47. Plant usually green or brown, leaves distinctly serrate all round : alar cells usually thin (48). Plant usually more or less purpurascens : alar cells coloured and their walls thickened (49).

48. Nerve 40-76 μ wide at base : monoicous (*W. serrata*). Nerve 60-90 μ wide at base : dioicous (*W. serrata* var. *mildei*).

49. 5-15 cm. high : leaves longly subulate, spirally twisted and slightly and remotely denticulate : nerve 80-90 μ at base, gradually lost in subule (*W. stenophylla*). Submerged, 20-25 cm. long, regularly pinnate : br. leaves narrowly linear and flexuately spreading, giving a plumose habit (*W. stenophylla* f. *inundata*).

50. Tufts purplish-brown to blackish (*W. glaciale*). Tufts pale green, reddish within, elongate and slender : leaves rather distant, with involute undulate margins : habit of certain slender N. American *Fontinalis* (*W. glaciale* var. *fontinaloides*).

LIST WITH REFERENCES TO AUTHORS' DESCRIPTIONS.

SCORPIDIUM (Schimp. Bry. Europ.) Limpr. Laubm. Deutschl. III., 520.

1. *S. scorpioides* (Linn. Sp. Pl. 1127) Limpr. Laubm. Deutschl. III., 520 ; Braithw., 54 ; Dixon, 546.

var. *typicum* Wheldon v. nov.

f. *virescens* Wheldon f. nov.

f. *fuscescens* Wheldon f. nov.

f. *versicolor* Wheldon.

var. *angustifolium* (Sanio 'Bryolog. Fragm. II.' Hedwigia, 1887, 129).

var. *gracilescens* (Sanio in Klinggr. Leb. und Laubm. Ostpreuss., 281).

var. *julaceum* (Sanio 'Comment. de Harpid. Europ. in Bot. Centralb. 1880,' p. 20).

f. *flavovirens* Wheldon f. nov.

f. *fuligineum* (Sanio. 'Bryol. Fragm. II.' in Hedwigia, 1887).

f. *rubrotinctum* Sanio. loc. cit.

2. *S. turgescens* (Jens., Vidensch Medd fra Naturh. foren. i. Kjob., 1858, 63) Wheldon ; Braithw., 244 ; Dixon, 549.

(To be continued).

FIELD NOTES.

BIRDS.

Grey Shrike at Scarborough.—On October 25th a Great Grey Shrike was seen near Scarborough by Mr. J. Morley, who knows the bird well.—W. J. CLARKE.

Little Gull at Scarborough.—On November 14th, while fishing from the East Pier, I noticed a Little Gull industriously fishing at the back of the wall in company with a large number of Black-headed and Herring Gulls. It was an immature bird in its first year's plumage. I had it under observation all the afternoon, but it had disappeared the following morning and has not been seen since.—W. J. CLARKE.

Pied Flycatcher Breeding near Wilsden.—Our local doctor's son informed me that recently he had received two eggs of the Pied Flycatcher which had been given to him by Mr. Williams, of this village, who found the nest from which the eggs had been taken in the Goat Stock Valley, near Wilsden, many years ago. I remember quite well Mr. Williams, when a boy, bringing me the eggs for identification, and soon after the eggs had been taken, I went with him to look at the nest. This is the first instance I have known of this species having a nest with eggs in this district. In *The Naturalist* for 1880-1881, Vol. VI., page 171, I recorded the Pied Flycatcher as having commenced to build a nest in the bole of a beech tree in Bingley Wood, but the nest was forsaken before any eggs were laid. Mr. H. B. Booth and I once heard and saw this species near Malham, but whether breeding we did not ascertain at the time. On migration, this species is to be seen in the Aire Valley, but very seldom remains to breed.—E. P. BUTTERFIELD.

Little Auks and Waxwings on the Yorkshire Coast.—During the last fortnight a few Little Auks have been noticed passing Scarborough. The first two were seen on November 9th, and the largest number in one flock was nine, on November 19th. On the same day a single specimen sheltered in the harbour. Several others have been reported along the coast during the same period. On November 14th, I saw three Waxwings feeding on the road, in the company of several Sparrows, within the Borough boundary. They were very tame, and permitted a close approach, remaining after the Sparrows had taken alarm and departed. There appeared to be one adult male, and two females or immature birds. On the following day a flock of eight was observed on the outskirts of the town, and on the same day one was shot by a man with a catapult in quite a different locality, but still close to the town. I hear of two parties of these birds at Whitby, so probably there has been a small immigration along the coast. Since writing the above I have seen or heard

of twenty Waxwings on November 23rd, seven on the 24th, five on the 25th, and nine on the 28th, all in the vicinity of Scarborough.—W. J. CLARKE, Scarborough, November 23rd.

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MARINE ZOOLOGY.

Young Herrings and 'Jellyfish' at Cullercoats.—On 2nd September, 1921, there were young herrings, O group, in Cullercoats Bay, and on 21st November, large quantities of *Tima bairdii* (Medusoid) were washed ashore at Cullercoats Bay. If any of your readers have note of the occurrence of the above we may be able to get some idea as to extent or rate of drift. *Tima* is exceptionally abundant this year, as I heard of large numbers of jellyfish up to the diameter of a penny being found on the sands at Whitley Bay on 3rd December.—B. STORROW, Dove Marine Laboratory, Cullercoats, Northumberland, 14-12-21.

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MAMMALS.

Badgers near Scarborough.—While the hounds were pursuing a fox on October 8th, it took refuge in a large burrow in Raincliffe Wood. On being dug out, the burrow was found to contain not only the fox, but also a couple of badgers and a rabbit, all of which were killed. On the following day, a homeless badger was encountered wandering about near the same place, and also was dispatched.—W. J. CLARKE.

Fawn and White Rat.—On 11th November, 1921, Mr Laisters F. Lort sent me a curiously-coloured Rat, which he had trapped in his garden at Menai Bridge, Anglesey. It was about half-grown, and the entire upper parts were of a pale fawn colour, the under parts and tail pure white. It was of the *M. decumanus* species. So far as is known it was perfectly wild, no similar animal having been seen or heard of in the vicinity.—H. E. FORREST.

Remains of False Killer (*Pseudorca crassidens*) in Lincolnshire.—According to the press, while digging at a farm at Thorney, seven miles from Peterborough, the remains of two whale-like animals were discovered. Mr. C. Foster Cooper, of the University of Zoology, Cambridge, informs me that he visited the site, together with Dr. Garrood (in whose possession the bones are now), and it is evident that a pair of False Killer Whales, probably a male and female, had been stranded at the time when this part of the country was an arm of the Wash. This species was originally described from a skull found in the fens near Stamford, though the species was subsequently found living in the North Sea.—T.S.

Erythristic Badgers.—In the September issue of the *Journal of Genetics*, Miss Frances Pitt has an illustrated paper on the Genetics of the Polecat, Ferret and hybrid Polecat-Ferrets. It is largely taken up with the consideration of the erythristic races of these animals, and the degree in which this colouration is inherited when light-brown animals are mated with those of the normal blackish hue. In the wild state a race of light-brown Polecats occurs only in Cardigan-shire. The light colour obtains through elimination of dark pigment in the hair. All the dark markings are present, but in a modified form—each part that is normally black being of a light-red colour. I mention these particulars in order to call attention to a parallel variation in the Badger. Four examples have come to my own notice:—(1) May, 1904, Worcester; (2) July, 1907, Hawkstone Park, Salop; (3) May, 1908, do.; (4), November, 1911, Llanidloes, Montg. No. 2 had pink eyes. Two others of the normal colour were killed at Llanidloes with No. 4, but it is not recorded whether they were of the same family. No. 3 went into Sir Beville Stanier's collection, and is now in the Museum at Newcastle-under-Lyme. Unlike the erythristic Polecats (which occur only in one district), it will be seen that these light-brown Badgers came from three widely separated localities. This fact is of importance from a genetic standpoint, and my object in asking the insertion of this note is to ask observers who have come across light-brown Badgers in any other part of the country to record the same in *The Naturalist*, so that we may have full data on the subject.—H. E. FORREST, Shrewsbury.

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ENTOMOLOGY.

Lancashire and Cheshire Entomology.—At a recent meeting of the Lancashire and Cheshire Entomological Society, the Hon. Secretary exhibited, on behalf of Mr. O. J. Wilkinson, photographs of *Pyrameis cardui* pupating, larva of *Hadena pisi*, and an unusual variety of *Chrysophanus phlaeas* taken at Delamere, having the right side var. *schmidtii* and the left typical. Mr. W. Mansbridge showed lepidoptera from N. Lancs.—*Vanessa io* with nearly blind eye-spots on hind-wings, from Cark; *Lycaena aegon* var. *masseyi* from Witherslack, and a short series from Delamere for comparison. From Arnside, Westmorland, *Argynnis euphrosyne* with pale ground-colour; *Thecla betulae*, *Nisoniades tages*, *Asphelia diluta*, *Phytometra viridaria* and *Ennychia octomaculalis*; from Formby, near Liverpool, a series of *Ebulea crocealis*, and from Cark a short series of *Gnophos obscurata* of a dark grey colour. The Rev. F. M. B. Carr showed a long

series of *Epunda lutulenta* from his garden at Alvanley, and said it had been abundant there this autumn; also two fine varieties of *Asphalia flavicornis* and a few *Pyrameis cardui* from Delamere. Mr. S. P. Doudney exhibited *Lycaena minima*, *Hyria muricata*, and *Strenia clathrata* from Witherslack; *Erebia epiphron*, *Coremia munitata*, *Larentia caesiata*, and *Venusia cambricaria* from Cumberland; also a fine underside aberration of *Lycaena aegon* with elongated spots captured at Delamere. Mr. S. Gordon Smith sent a fine drawer of *Smerinthus tiliae* and a large number of varieties of other species captured or bred this season in various localities; prominent among the latter was a specimen of *Triphaena pronuba* with hind-wings nearly white, bred from a wild pupa dug at Tarvin, near Chester; an aberration of *Vanessa urticae* with nearly black hind-wings captured at Parc Lywydiarth, N. Wales, *Triphaena fimbria* with crescent mark in hind-wings, bred from Delamere; two vars. of *Nemeophila russula*, also with hind-wings black nearly all over, taken in the New Forest; *Zygaena trifolii* and confluent forms, *Boarmia roboraria*, *Phorodesma pustulata*, *Pterostoma palpina* and *Leucania turca*, all from the New Forest; a fine series of *Cidaria truncata* from various localities comprising vars. *centumnotata*, *commanotata*, *perfuscata*, etc., was much admired, and a long series of *Boarmia repandata* which contained several examples of the Penmænawr melanic form characterised by whitish submarginal blotches on the black ground. Mr. Chas. P. Rimmer had a box of micro-lepidoptera taken this year chiefly round Liverpool, also his fine series of *Hibernia defoliaria* from Delamere. Mr. A. E. Hughes exhibited from Witherslack a long series of *Carsia paludata*, *Lycaena aegon* and *Coenonympha typhon*, and from Cartmel *Argynnis euphrosyne*. *Plusia moneta* is now well established in Cheshire, and there was a long bred series from Carrington exhibited by Mr. R. Tait. Mr. J. B. Garner-Richards and Mr. H. B. Prince also exhibited, and Mr. J. W. Griffin had a nice row of *Trichiura crataegi*.—WM. MANSBRIDGE.

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GEOLOGY.

Mammoth Tooth from Auburn, E. Yorks.—Mr. William Audas, of Bridlington, has given to the Hull Museum a mammoth tooth which he has recently picked up on the beach at Auburn, near Bridlington, where it had apparently recently fallen from the cliffs. The specimen is weathered, and consists of twelve 'plates.' It is six and a half inches in length, two inches wide, four inches deep, and weighs twenty-four ounces.—T.S.

VERTEBRATE ZOOLOGY IN YORKSHIRE.

A meeting of the Vertebrate Section of the Yorkshire Naturalists' Union was held in the Library of the Leeds Philosophical Society on Saturday, October 22nd, Mr. S. H. Smith presiding.

The Sectional Meeting was preceded by a Meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee (Mr. H. B. Booth occupying the chair in the absence of Mr. St. Quintin) and of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee (Mr. C. F. Proctor in the Chair).

The following recommendation was brought before the Sectional Meeting by the Yorkshire Wild Birds and Eggs Protection Committee, and approved :—

'The Yorkshire Fishery Board has made a complaint to this Committee of the harm done by Herons to the fish and fishing in the upper waters of many of our rivers.

At a Special Meeting, called to consider this question, we have come to the conclusion that the Heron might well be taken off the complete Protection List, but in all cases they should be protected during the Breeding season, *i.e.*, March 1st to August 31st.

We think that this would fairly meet the wishes of the Angling Society and of your Committee.'

It was accordingly decided to recommend the County Councils to place the Heron on the ordinary Schedule.

A paper was read by Mr. H. B. Booth, the President of the Union, entitled 'Notes on the Distribution of the Lesser Horse-shoe Bat.'

The lecturer pointed out that although this species had a wide range on the Continent, being found South of the Baltic in Europe and with allied species ranging into North Africa and up into the Himalayas, its distribution in this country was puzzling. He said that a crescent with one tip placed in Kent and with the other in Yorkshire, and its greatest width in Wales, outlined its distribution in this country, except for the South of Ireland.

On June 5th, 1921, Mr. Booth was so fortunate as to capture a living specimen near Helmsley. This is the first Yorkshire record for a quarter of a century. The specimen was a female, heavy with young, and it seems certain that a colony must exist in that neighbourhood.

Mr. Whittaker attributed the dearth of records to the small number of skilled observers.

A paper was next read by Mr. S. H. Smith entitled 'Notes on the Turtle Dove in Yorkshire.' It dealt mainly with the range of this species in the County, and the lecturer was led to believe that the species was becoming more numerous, even in those haunts where it had been long known to occur. It particularly favoured arable land interspersed with small woods and copses, sheltered valleys and the foot-hills of the Wolds.

The main body of birds arrive on the Southern Coast between May 4th and 18th, and the movement is almost entirely northwards, as much as a month sometimes elapsing between their arrival on the south coast and their being noted in Yorkshire. Evidence was given that a small migratory movement took place across the North Sea, odd birds having been seen arriving near Spurn.

It was generally agreed that the species is now plentiful in many parts of Yorkshire.

At the Evening Meeting Mr. R. Chislett read a paper entitled 'The Great and Arctic Skua in Shetland,' and Mr. T. W. Fowler one entitled 'The Great and Arctic Skua in Orkney.' Both papers were illustrated by lantern slides.

Mr. Chislett stated that the Great Skua bred in Iceland, the Faroes and in the Shetlands and Orkneys. As long ago as 1861, it was predicted that this bird would soon be extinct in Shetland, but the lecturer had found eighteen nests on one Island.

On approaching the nests the birds would fly full tilt at the intruder's face, but swerved aside at the last moment if the arms were raised above the head. On the nest they were very stolid, and the lecturer found it difficult to induce them to change their position, even when shouted at. One bird alighted on his tent, where its whole weight had to be carried by his head.

Photographs were shown of the young, which are quite unlike young Gulls. The manner in which this bird obtains its food by robbing the Gulls of their catches of fish was also described.

The Arctic or Richardson's Skua is a smaller and more active species, it will also attack an intruder, but prefers to do so from behind. An instance was given when one of these birds stunned a dog and broke its own neck in the process. They are always on the look out for predatory birds and chase them far from the vicinity of the nest. The nest is easy to find as the birds' efforts to decoy one away from the vicinity of the nest diminish rapidly once the nest has been passed. The pale and dark forms of this species were present in about equal numbers.

Mr. Fowler confirmed most of the observations made by Mr. Chislett, and stated that he was only able to find one pair of Great Skua nesting in Orkney in 1921, though they found many pairs of the Arctic Skua nesting, the light and dark varieties being also in about equal numbers.

Mr. Riley Fortune gave a paper entitled 'Some Notes on the Farne Islands,' illustrated by slides. He pointed out the damage that had been done in past years by visitors to the Knoxes, where the Terns formerly chiefly nested.

The lecturer described their progress as a trail of death and suffering, as they unknowingly trampled eggs and young birds underfoot. As a result people were not allowed to visit the Knoxes, but most unfortunately the birds had this year deserted the Knoxes and taken up their quarters on the Brownsman, where numerous visitors had done incalculable harm. This was greatly intensified by the fact that one motor boat can bring over in one day many times the number of passengers that could be rowed over in cobbles. Immediate action was necessary if the bird life on these Islands was to be preserved.

It was pointed out that this had been a very bad year for the Terns, chiefly because of the failure of the Herrings to arrive, consequently the adult birds had been driven to feeding their young on unsuitable food, with the result that many had died. The lecturer also dealt on the harm done by the Lesser Black-backed Gulls, and the need for further measures to be taken in this connection. He described how he had seen young Eider Ducks throw themselves over a cliff 50 ft. high into the sea, without in any way injuring themselves.—E. WILFRED TAYLOR.

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FLOWERING PLANT.

Cephalanthera Damasonium Druce (Syn. **C. grandiflora** Gray; **C. pallens** Rich., etc.).—The creamy-white flowered, larger *Helleborine*, according to Dr. Druce's knowledge, not previously recorded for Yorkshire, has turned up in a most natural habitat—a calcareous wood—near Brough, E.R. Yorks. The information, with fresh specimens, was first communicated to the writer by Mr. W. S. Bisat, of North Ferriby, in June, 1921; but this beautiful orchidaceous species had been first discovered in this station by Miss Burnett and Mrs. Bisat in the early summer of the previous year, 1920.—J. FRASER ROBINSON.

ADDITIONS TO THE PLANT GALLS OF SCARBOROUGH.

WM. FALCONER, F.E.S.

THE following plant galls, observed during the first week of September last, are either additions to (these are distinguished by an asterisk), or extended stations for, the forms recorded for the district in *The Naturalist* for December, 1919, and February, 1920.

DIPTERA.

- Iteomyia capreae* Winn. On *Salix caprea* and *S. aurita*,* in Raincliff Woods; on *S. caprea*, Cayton Bay.
- **I. capreae* var. *major* Kieff. On *S. aurita*, in Raincliff Woods, but not at all common.
- Rhabdophaga nervorum* Kieff. On *S. caprea*, in this instance a swelling and torsion of the lateral veins, between Ravenscar and Robin Hood Bay.
- Perrisia persicariae* Linn. On *Polygonum amphibium*, Scarborough Mere, abundant.
- **P. fructuum* Rübs. On mouse-ear chickweed, Ravenscar.
- **P. pustulans* Rübs. On meadow sweet, in a damp spot between Ravenscar and Robin Hood Bay.
- **P. plicatrix* H. Löw. On bramble, Raincliff Woods and Robin Hood Bay.
- P. rosarum* Hardy. On wild rose, Scalby.
- **P. tortrix* Rübs. On wild *Prunus domestica* bushes lining one side of the footpath between the Cemetery and Lady Edith's Drive, in plenty.
- **P. loticola* Rübs. On *Lotus corniculatus*, several examples towards Scalby Mill.
- Macrolabis corrugans* F. Löw. On hogweed, the Mere and between Ravenscar and Robin Hood Bay.
- **Perrisia fraxinea* Kieff. On the ash, Hayburn Wyke and Rievaulx Abbey.
- **Oligotrophus bursarius* Brems. On ground ivy beneath some of the trees in Lady Edith's Drive.
- Perrisia galii* H. Löw. On lady's bedstraw, cliffs to Scalby Mill.
- **Perrisia* spec. Houard, No. 5289, on the same plant in the same locality, the same as that unnamed in December, 1919.
- Rhopalomyia millefolii* H. Löw. On yarrow, cliffs to Scalby Mill, and at Robin Hood Bay, in plenty. Doubtless often overlooked from the position of the gall, oftener at the base of the stem than elsewhere, and thus hidden by the herbage from casual observation.
- **Perrisia cirsi* Rübs. On *Carduus arvensis*, near Scalby Mill.

HOMOPTERA.

- **Brachycolus stellariae* Hdy. On soft fog grass and mouse-ear chickweed, between Ravenscar and Robin Hood Bay. On greater stitchwort, Lady Edith's Drive.
- **Aphis* spec. On crab apple, cliffs near Scalby Mill, growing with blackthorn, similarly galled.
- **Aphis* spec. On hawthorn, near the cemetery. In both the above, the aphids had gone, and as more than one species galls the respective plants, I have not named them specifically.
- **Psylla buxi* Linn.—On box, grounds of the Mere.
- **Trioza urticae* Linn. On nettle, between Ravenscar and Robin Hood Bay.

ACARI.

- **Eriophyes tenuis* Nal. On cocksfoot grass, by the roadside at Scalby.
 **Eriophyes spec.* On *Salix fragilis*, narrow tight marginal leaf rolling, Houard, S.53, the Mere.
E. salicis Nal. On *S. caprea*, Raincliff Woods
E. laevis Nal. On alder, Lady Edith's Drive.

FUNGI.

- Taphrina aurea* Fries. On poplar, the Mere and Peasholme Gardens.
 **Exoascus turgidus* Sdbk. On birch, two trees in Lady Edith's Drive, one with more than a dozen of these 'witch's brooms' on it.
E. alnitorquus Winter. Alder leaf blister, Lady Edith's Drive.
 **Puccinia poarum* Nielsen, on coltsfoot, the Mere, near Cayton Bay, and between Ravenscar and Robin Hood Bay.
 **Urocystis anemones* Pers. On the blade and petioles of creeping buttercup leaves, Raincliff Woods.

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Hull Museum Publications, No. 96. Index to Hull Museum Publications, Nos. 48-95, by **Thomas Sheppard**, 1921, price 2d. An index to Nos. 1-47 was issued in 1908. The present index has been delayed by printing difficulties, and Mr. Sheppard promises another shortly, since there are now 123 of these varied but always interesting publications, the value of which will be enhanced by the indexes. The entries are arranged in simple alphabetical order, which remains, when all is said, the most convenient. Key-words, such as 'Anglo-Saxon,' and 'Axe-head' are repeated, though space might have been saved by substituting a short rule. The misprints observable will mislead no one, but the duplication of entries is not always adequate; for instance, under 'Axe Head,' there should be reference to Ashby, No. 61, p. 20, and if 'Earl Carrington' is to find place as well as 'Carrington, Rt. Hon. Lord' (which is a mouthful for an index), then he should be credited with the same entries. Lord Yarborough, we note, is indexed only under 'Earl Yarborough.' Tom Smith, on the other hand, gets in under no less [*i.e.* fewer] than three heads, but does not score, for the references are different in each case. A gentleman with the far more imposing name of Justinian Angell appears only under Spurn. Finally, was it really necessary to print in successive lines: 'Zoo, Hull, No. 77, p. 11,' and 'Zoological Gardens, Hull, No. 77, p. 11'? Spots on the sun, no doubt; but some of them leave us wondering whether Mr. Sheppard was allowed to see a proof.—F.A.B. [He was, by the gracious condescension of the printer, and each 'corrected' proof came back worse than the preceding; so he gave it up. Each copy of the Index cost 10d., is 'offered' for sale at 2d., but is actually given away to institutions likely to value it.—ED.]

Hull Museum Publications, No. 123. Andrew Marvell Tercentenary Celebration. Descriptive Catalogue of Exhibits at the Wilberforce Museum . . . March 31st to April 7th, 1921, 36 pp., 1921, price 2d. Marvell was born at Hull in 1921*; educated at the Grammar School under his father, and thrice elected to represent the burgesses in Parliament. The exhibits comprised books by or relating to Marvell and his contemporaries, portraits and relics of Marvell and his contemporaries, medals and coins connected with Marvell and his times, including one struck for this tercentenary and designed by Mr. T. Sheppard, Civil War Tracts, prints and other objects illustrating the period. A remarkably interesting assemblage.—F.A.B.

* We print this as written merely to show that the most critical can make slips; the sentence should read, 'Marvell was born at Winestead in 1621.'

The Naturalist.

A MONTHLY ILLUSTRATED JOURNAL OF NATURAL HISTORY.

Edited by

PPARD M.Sc., F.G.S., F.R.G.S., F.S.A. (Scot.) and
WOODHEAD, M.Sc., Ph.D., F.L.S.

The Museum,
Hull.

*With the Editor's
Compliments.*

SOME NEW BOOKS.

Notwithstanding the high cost of paper and printing, quite large numbers of books appear—some of them being scientific, others 'popular,' some both, some neither. Still, they come.

Some Birds of the Countryside: the Art of Nature, by H. J. Massingham (T. Fisher Unwin, 208 pp., 12/6). Much of this volume has already appeared in the *Contemporary Review*, *Athenæum* and other well-known journals, which is some index to the nature of the stories, which deal with the coast of South Wales, The Flats (Norfolk), A City of Birds, Gilbert White and Selborne, Bird Haunted London, A Dorset Diary, A Village in Hampshire, and Charles Waterton, the last a well known Yorkshire squire and naturalist. This chapter will appeal particularly to readers of *The Naturalist*. The volume is dedicated 'To —,' which would be equally appropriate to quite a number of lady friends!

From the same house has been issued a similar volume, entitled **Dogs, Birds and Others: Natural History Letters from *The Spectator***, chosen by the author of the preceding volume (198 pp., 8/6). In this he gathers together a quite remarkable series of stories relating to the sagacity of dogs, and gives scientific explanations of their achievements, some being truly astonishing. Similarly, the pages of *The Spectator* have provided quite a wealth of material dealing with various aspects of bird life, and among the many chapters we notice 'Birds and the Arts—Illustrated in their Music, Dancing, Painting, Architecture, Drama and Flight, together with some Critical Appreciations.' There is also An Anthology of Animal Notables, Squirrel Memoirs, and Captive Animals. All are admirable and devoid of 'piffle.'

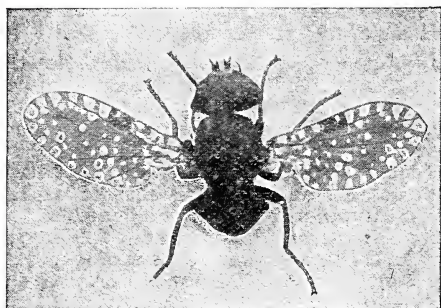
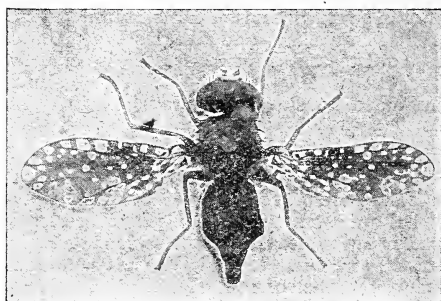
Life of Alfred Newton, by A. F. R. Wollaston, London: John Murray (322 pp., 18/- net). Many others besides ornithologists will be interested in this excellent narrative of a great man's great work. It is a charming story, and is well worth perusal, a fact patent from the fact that Mr. Murray is the publisher. There is an admirable Preface by another veteran, Sir Archibald Geikie, from which we learn that: 'The subject of this volume, a man of strongly-marked personality, was for more than half a century a leader among the naturalists of this country, a distinguished Professor in the University of Cambridge, a prolific and accomplished writer, and a charming companion, whose geniality, humour, and innocent little whimsicalities drew around him a wide circle of friends. All who knew Alfred Newton will be glad that Mr. Wollaston, one of his pupils, should have put together this appreciative memoir. In so doing he has been fortunate in having had access to so large a number of the Professor's letters and journals as to give the chapters not a little of the character of an autobiography.'

The Wit of the Wild, by E. Ingersoll, London: G. Routledge & Son, 212 pp., 6/- net. This is of the 'popular' variety, and deals with 'The Way of the Weasel,' 'The Squirrel's Thrift,' 'Animals that Advertise,' 'Do Animals Commit Suicide,' and so on. There are 'plates'—some from poor and worn blocks.

We have long admired Prof. G. H. Carpenter's work in connexion with *The Irish Naturalist* and other publications; he is a very busy man, and has many duties, official and otherwise. But notwithstanding this, he occupies his 'spare' time in scientific research, one result of which is a valuable volume on **Insect Transformation** (Methuen & Co., 282 pp., 12/6), which in many ways is reminiscent of Miall's *Aquatic Insects*, to which work the author is admittedly indebted. With the aid of over 280 sketches and some plates, he expounds his well-digested views on the form, growth and change of insects, the open type

of wing growth, the hidden type of wing growth, wingless insects, the class and orders of insects, growing insects and their surroundings, and the problems of transformation. There is no attempt at padding, and the closely-printed pages reveal a wealth of scientific information, written in a style which will appeal quite readily to an average reader, but is positively fascinating to a naturalist.

Of a perhaps more technical nature, though equally essential to the student of insects, is **Typical Flies: A Photographic Atlas**, by **E. K. Pearse** (second series), 4to. Cambridge University Press, xiv. × 38



Carphotricha guttularis Mg. ♂ 4×8 mm., ♀ 4'5×9 mm.

Found by sweeping among *Galium verum* at Copford, Essex.

New Forest, but not common' (Adams). 'A dark brown fly, legs and wing markings bright red brown.'

pp., 15/-. In this Atlas are 125 blocks, many containing two illustrations, which will be of incalculable value to the growing school of students of the diptera. Hitherto this branch of natural history has been sadly neglected because of the difficulty of identifying captures, but, thanks to the researches of Wingate, Bagnall, Harrison, Cheetham and others, as evidenced by a perusal of the pages of *The Naturalist*, this difficulty is being overcome, and we even hear of excursions of dipterists, while twenty years ago it was difficult to find one. We are permitted to reproduce two of the illustrations which, with the description, will give an idea of the nature of the Atlas.

Exploration of Air Out of the World North of Nigeria, by **Angus Buchanan**. London: John Murray, 253 pp., 16/-. Mr. Buchanan has had exceptional opportunities of visiting a portion of central Sahara

unknown to English-speaking people. Besides being an able writer, he is a thorough naturalist, and by the aid of reproductions of an enormous number of photographs, and an excellent map, he gives an insight into the history of the various animals from man down to insects, met with in his travels. Not only is the book a charming narrative of travels in 'darkest' Africa, but the number of mammals, birds, butterflies and moths new to science, as a result of the author's researches, is proof of his qualifications as a naturalist. We have read his book with very great pleasure and profit.

Sporting Trips in Europe and Algeria: A Record of Sport in the Alps, Pyrenees, Norway, Sweden, Corsica and Algérie, by **Hugh P. Highton** (London: Witherby & Co., 237 pp., 16/-). The title of this book well describes its scope. The publisher informs us that:—'This record furnishes the sportsman with an exceedingly useful, amateur guide in his choice of easily reached terrain for game unobtainable at home. It also gives the student of nature with a penchant for out-of-the-way places a fascinating succession of pictures of the natives, their surroundings and sporting methods.' There are several reproductions from photographs, though, unfortunately, the frontispiece, called 'Success: a burden of thirty-five kilos,' which is probably meant to be the author with a good 'bag' of game, seems to us to represent a woodman bringing home his faggots! And surely the gentleman sat down, on the plate facing page 77, has legs about six feet in length! If the camera so distorts mere man, how may we rely upon it for the photographs of the records of 'big game' which the book contains? Many of us have spent pleasant and unpleasant Sundays. But the author once 'left for Botten in the morning, and enjoyed a really delightful sunny drive beside lake and river; a warm air above, and the cool splash of sparkling water singing sweet music to the ear. What better Sabbath service than this?' The answer is: 'Ask a clergyman!' Yet we like the book.

The Evolution of Civilization, by **Joseph McCabe** (Watts & Co., 120 pp., 3/6). If for nothing else, we must admire Mr. McCabe for his industry in the cause of truth. We must also thank Messrs. Watts & Co., for the way in which they popularise books bearing upon truth. In the present volume, the author deals with A Million Years of Childhood, Ancient Crete, Old Egypt, Babylon, the Hebrews, The Splendour of Greece, the Vices and Virtues of Rome, The New Era. The book is cheap and good, which, we believe, is the aim of Messrs. Watts.

Wanderings of a Naturalist, by **Seton Gordon** (Cassell & Co., 220 pp., 15/-). Readers of *Country Life* and other journals are familiar with the work of Mr. Seton Gordon, and *The Scotsman*, *The Times* and other papers have also published articles from his pen, many being reprinted in the present work, which is principally devoted to the Scottish Highlands and their avifauna; but the coasts of Ireland and Northumberland are touched upon as well as the Pyrenees. The book is in Mr. Gordon's familiar style, contains 44 chapters, and is illustrated by 78 reproductions from photographs—principally excellent, and dealing with various aspects of bird life.

Animal Ingenuity of To-day, by **C. A. Ealand** (Seeley Service & Co., 313 pp., 8/6). The sub-title of this work perhaps best defines its scope:—'A description of the skill, clever devices and stratagems of birds, reptiles, insects and other forms of animal life; their means of subsistence and protection.' The volume, which is illustrated, contains a record of the many extraordinary devices adopted by all classes of animals, from the highest to the lowest. Bees, wasps and ants, of course, occupy a prominent position in the work, but the author has succeeded in gathering together much of great scientific interest, and frequently of an unusual and unexpected nature. The book is pleasantly written.

The Wonder Book of Science, by **J. H. Fabre**. London: Hodder & Stoughton, 287 pp., 8/6 net. It is not necessary to 'paint the lily,' and we shall not occupy space in referring to Fabre's wonderful style. We merely draw attention to the fact that this book contains forty-eight chapters dealing with such varied subjects as Cockchafer, Mole, Nest, Cultivated Plants, Tobacco, Air, Sea, Coal, Earthquakes, Thunder, and Light.

Practical Chemistry of Coal, by **A. E. Findley** and **R. Wigginton**. London: Benn Bros., 140 pp., 12/6 net. By the aid of elaborate graphs, tables, diagrams and formulae, this technical subject is dealt with by the authors, and the work 'embodies, with additions, the laboratory course in fuel technology at Sheffield University, and which should prove useful to chemists, Gas Analysts, Manufacturers of By-products, and users of Coal; Purifying materials, Ammonia, and its Allies, Benzol, Coal Tar and its Distillates, Coal Ash, Gas Analysis, Calorimetry and Pyrometry, Fuel Oils.'

Outlines of Zoology. By **J. A. Thomson**. London: Messrs. Frowde, Hodder & Stoughton, xxii.+869 pp., 18s. net. Professor Thomson's book is so well known to our readers that we feel it unnecessary to do more than call attention to the fact that Messrs. Henry Frowde, Hodder & Stoughton jointly have published a seventh edition of the work, which, notwithstanding the fact that it contains close upon a thousand pages and is illustrated by 400 blocks, is compact in form and in every way admirable for its purpose. It speaks well for students and publishers alike that two volumes, such as this and the one in the following notice, have been issued at the same time.

Zoology for Medical Students. By **J. Graham Kerr**. London: Macmillan & Co., viii.+485 pp., 25s. net. With the clear type and abundance of carefully prepared illustrations which we have come to expect from the House of Macmillan, the present volume is all that can possibly be desired by the student. The author is a Professor of Zoology at the University of Glasgow, has had considerable experience in connexion with the requirements of medical students, and by the aid of over 200 admirable diagrams, specially prepared with the object of drawing attention to the particular points required, the author has considerably simplified the constantly increasing work which our medical men have to undertake in connexion with their degrees. In an excellent introduction Professor Kerr gives reasons for the particular character of the book, and after careful perusal we cannot very well say which we admire most, the clearness of the text or the charm of the illustrations.

Economic Mineralogy. By **Thomas Crook**. London: Longmans, Green & Co., xi.+492 pp., 25s. net. This is a practical guide to the study of useful minerals, and its appearance might almost have been anticipated as a result of the extraordinary production of memoirs dealing with our Economic Minerals, which have been issued by the Government and various institutions, more or less directly as a result of the conditions brought about by the war. There can be no doubt that the cessation of the free and easy way in which previously we were able to obtain our supplies from all parts of the world, has resulted in more attention being paid to our own resources, and investigations in various and numerous directions have been made much more thoroughly than was previously necessary. The present volume, with its various appendices, its excellent illustrations and elaborate index, will prove of inestimable value to the student of Minerals, economically and otherwise.

History of the Whale Fisheries. By **J. T. Jenkins**. London: H. F. & G. Witherby. 336 pp., 18s. net. Dr. Jenkins' work in connexion with the Lancashire and Western Sea Fisheries, as well as the previous books which have issued from his pen, lead us to expect a volume

which is equally valuable historically and scientifically; and in this we are not disappointed. The present book claims to be the first history of the whale fisheries ever published in the English language, and it deals with the subject from the Basque fisheries of the tenth century, to the hunting of the finner whale at the present date. By the aid of innumerable reproductions of old prints, quotations, and many extracts from out-of-the-way sources (even the penny Quarterly Records of a certain Yorkshire Museum being quoted), the author has brought together a narrative as fascinating as any book of adventures which we have read in recent years. It is gratifying to find the extent to which Yorkshire has played its part in this industry. In addition to the narrative itself, the author gives an excellent Bibliography, though in this we fail to find all the items referred to in the text. Hull's contribution to the volume is exceedingly gratifying, notwithstanding the statement that in some respects the Hull people, together with those in London, once were 'interlopers.'

Lichens. By **Annie L. Smith.** London: Cambridge University Press, xxviii.+464 pp., 55s. net. As has been shown recently in these pages, there is evidence of an increased interest being taken in Botany other than the flowering plants, and the usually neglected Lichens have of late received considerable attention. Among publications which have been issued the present volume at once takes a premier position, and has the advantage of being written by one of our most brilliant students of Lichenology. Apparently the book has been delayed owing to war conditions, but this delay has enabled the author to bring the history of the literature on the subject, referred to in the valuable and extensive Bibliography, more up to date. Naturally publications of this character are not likely to have a tremendous demand, and bearing this in mind and the large amount of information in nearly 500 pages with over 100 illustrations, the price cannot be looked upon as unreasonable. We must congratulate the author, editor and publishers on this excellent production, which will unquestionably remain the standard work on the subject for a considerable time.

The Rift Valleys and Geology of East Africa. By **J. W. Gregory.** London: Seeley, Service & Co., 479 pp., 32s. net. Professor Gregory's work on the great Rift Valley some years ago brought forward an entirely new theory to account for certain features on the African Continent, and since then the author has continued his researches in Australia and other parts of the world, subsequently returning to Africa, with the result that the present work has been produced. The nature of its contents can best be described by its sub-title, 'An Account of the Origin and History of the Rift Valleys of East Africa and their Relation to the Contemporary Earth-movements which Transformed the Geography of the World; with Some Account of the Prehistoric Stone Implements, Soils, Water Supply, and Mineral Resources of the Kenya Colony.' Dr. Gregory's style is probably well known to our Geological readers, and requires no recommendation, though we must say in the present instance the extraordinary number of references and notes which occur throughout the text rather detracts from the straightforward narrative which we have been in the habit of expecting from Professor Gregory, the result being that a reader feels like perusing a volume of Proceedings of an important Geological Society rather than a book dealing with changes in the earth's crust. There is a Bibliography, startling in its extent; a subject index, an index of authors, and an index of localities, from which list many minor localities have been excluded. We must admit, however, that from the point of view of the practical student, one index embracing the whole of the items would have been more acceptable.

CORRESPONDENCE.

SNAKESTONES.

Professor Myers has sent me an interesting extract from *The Naturalist* for November, 1921, and suggested that I should send you our crest and motto. The crest is, of course, adapted from the Whitby one, though I personally am sorry we did not leave the snake's head on it. The motto



was chosen for us by our Founder, Miss Dorothea Beale, and may allude to St. Hilda's prowess in transforming serpents into ammonites as related by the Venerable Bede, as well as to her educational foundations.—(Miss) W. H. MOBERLY (Principal), St. Hilda's Hall, Oxford, Nov. 14th, 1921.

WAXWINGS.

On the morning of the 21st inst., walking around the fields within a mile from here, I observed in the distance something unfamiliar in bird life—with the aid of my glasses I was at once able to identify the Waxwing, four of them. Approaching nearer, I took up a position to watch and for two hours kept a close observation, during the whole of which time they were never more than ten yards away, and on several occasions coming within a few feet of me. The waxy tips to the secondaries, the white on the primaries, and the broad yellow terminal band of the tail feathers of one of them were considerably pronounced, with also darker chestnut markings of the forehead and crest, and brighter black throat, lores, etc.; a certain male, and perhaps three females, exceedingly tame, taking little or no notice of me; almost silent, but at times uttering a low, plaintive trill. The flight resembles the Starling. They appeared to be very active amongst the branches, greedily feeding upon the fruits of the Wild Rose, Elder and Hawthorn, apparently favouring the first-named, one bird swallowing five hips in quick succession. When not feeding, they sat quietly in a small Ash tree with perceptively extended crops, and feathers generally ruffled, excreting continuously, after an interval returning to feed and then back again. On the afternoon of the same day and during the morning of the following day, I found them exactly in the same place going through the same performances. The next morning I again visited the site to find a workman repairing a fence close by, the birds disturbed and gone. Being now familiar with their note enabled me quickly to locate them a field away. They returned to their old feeding ground when the man left his work.—SYDNEY H. WATERHOUSE, Sutton-on-Hull, November 23rd, 1921.

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An admirable memoir on the late Wheelton Hind, with portrait and 'complete list of scientific papers other than those on medical subjects,' is in *The Transactions of the North Staffordshire Field Club*, Vol. LV.

Conquest for November contains a well illustrated article on 'Arctic Plants and Sea Birds in Spitsbergen,' by J. S. Huxley; 'Volcanoes: their Formation and Activities,' by P. J. Risdon, and many other well-illustrated notes of more than general interest.

The transfer of the Leeds Philosophical Society's Museum to the Corporation has now taken place, and the management is invested in a committee of seven appointed by the Society, and a similar number by the Corporation. Of this committee, Mr. Edwin Hawkesworth, Hon. Treasurer of the Yorkshire Naturalists' Union, is the chairman.

'CONTRIBUTORS TO THIS NUMBER.'

Under the above heading our contemporary, *Discovery*, for December, occupies some space in drawing attention to the importance and achievements of its contributors. Possibly we may be pardoned for following this good example? :—

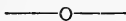
'ED,' whose identity we are requested not to divulge, is a well-known expert on 'water' and its dilutants, makes his pen his spear, and is the author of 'Correct Arms.'

CHRIS. A. TREATAM: Suffers peat gladly, writes on Diptera and Hemiptera, is a Bachelor of some degree. Spends his summer in exploring the wilds of Austwick, where he has been seen to fold up his tent and silently steal away. Authority on 'Work for Young Naturalists.'

T. PEPPERED: A regular contributor and never particular as to his subject or object. Born on a farm in Lincolnshire, he has therefore a practical as well as a theoretical knowledge of agriculture. Reached Yorkshire soon after, and is therefore often mistaken for a Yorkshireman. Was made M.Sc. by the Leeds University for his studies in 'honoris causa,' a subject he has made particularly his own. Author of various works in the 'Lost' series.

H. B. SMOOTH: Rough on egg-collectors; authority on Swallows and wool—not the author of 'Kittens in Jumpers.' Has just vacated a chair in favour of a botanist.

CORRECTION: We regret that the 'Books Recommended' last month should have been 'Books not recommended.'



There is a particularly fine series of 'Field Notes' in *The Entomologist* for December.

A. Sich writes on the 'Early stages of *Coleophora ornatipennella*, Hb. in *The Entomologist's Record* for November.

Discovery, No. 23, informs us that 'it is common for Swiss girls both to produce and to cure warts by autosuggestion.'

F. Raw occupies four pages of *The Geological Magazine* (No. 689) in describing a mammoth tooth found near Stroud.

K. Wilson contributes a 'Catalogue of Local Coleoptera' to the *Transactions and Journal of the Eastbourne Natural History Society*, No. 32.

No. 690 of *The Entomologist's Monthly Magazine* contains, among many other items, *A Saprosites* (? *parallellus*) in Britain; and *Ips* (*Tomicus*) *erosus* in Britain.

The *Revue de Geologie* for November contains 52 closely printed pages of summaries of geological memoirs, including a quaint notice of Buckman's *Type Ammonites*, by M. Cossmann.

Baron G. J. de Fejervary gives 'Contributions to a Monography on fossil Varanidae and on Megalanidae' (in English) in *Annales Musei Nationalis Hungarici*, Vol. XVI., recently to hand.

In *The Quarry*, J. V. Elsdon and J. A. Howe have a series of articles on 'The Stones of London,' in which many north country rocks, used in the erection of buildings in London, are described in detail.

Among the contents of *The Journal of Roman Studies*, Vol. IX., part 2 are 'The Agricolan Occupation of North Britain,' by G. MacDonald, and 'Roman Colchester,' by R. E. M. Wheeler and P. G. Laver.

Much of *The Lancashire and Cheshire Naturalist*, Vol. XIV., No. 2, is occupied by a paper on 'Plant Galls of Cheshire,' by A. A. Dallman, and the continuation of the 'Muscineae of the Wirral,' by W. A. Lee and W. G. Travis.

W. Rowan gives 'Observations on the Breeding-Habits of the Merlin,' with photographic illustrations, in *British Birds* for November. His observations were made on the moors near Skipton. The same journal contains 'The Sequence of Plumages in some Palearctic Surface-feeding Ducks,' by E. L. Schiöler.

Ammonites fabalis Simpson, from the Lias at Whitby, and an interesting series of Kelloways ammonites, occur in Buckman's *Type Ammonites*, Part XXIX.

In No. 307 of *The Quarterly Journal of the Geological Society*, Prof. W. J. Sollas has a paper on *Saccammina carteri* Brady, and the Structure of the Foraminiferous Shell, based largely upon Northumberland material.

Mr. R. Gurney favours us with an admirable and well illustrated paper by W. G. Clarke and himself on the 'Genus Utricularia and its Distribution in Norfolk, reprinted from the *Transactions of the Norfolk and Norwich Naturalists' Society*.

A somewhat unusual note on 'Museum Limits' appears in *The Museums Journal* for December. The writer thereof refers to 'the habit of mind of a Museum Keeper,' and, later, 'will be prepared to hear same connoisseur holding up his hands in horror.'

The Scottish Naturalist, No. 117, contains a continuation of the report on Scottish Ornithology in 1920; Notes on Winter Occurrence of the Common Tern in Scotland by W. E. Collinge, and Hemiptera from Arran, by E. A. Butler, as well as many shorter notes.

Among the contents of *The Vasculum* for October, we notice 'The Purpose of the Roman Wall,' by R. G. Collingwood; 'Medical Entomology,' by A. D. Peacock; 'Eel-worm Galls,' by R. S. Bagnall; 'Fluorspar,' by J. A. Smythe, and an obituary notice of the late John Gardner.

The July-October number of '*Bibliotheca Sacra*' (Oberlin, Ohio) contains a number of memoirs by different members relating to the work of the late George Frederick Wright, who for many years has acted as Editor of that publication. An excellent portrait appears as frontispiece.

H. F. Witherby writes 'On the British-taken Examples of the "Levantine" Shearwater,' in *British Birds* for December. He considers that of the 28 specimens recorded in Britain, 12 of those he has seen are referable to *Puffinus mauretanicus* and not to *P. yelkouan*; five others of which he has received descriptions (including birds in the Hull Museum) are also clearly *mauretanicus*.

An urgent appeal is issued to the subscribers of *The Irish Naturalist* to suggest means whereby the Journal may be carried on, as at present a considerable sum of money is lost annually, although every effort is made to cut down expenses. The November issue of the Journal contains a note on 'Nests of the Ant *Stenamma westwoodi*, discovered in Ireland,' by R. A. Phillips, and 'The Earliest Irish Zoologist,' by R. F. Scharff.

The Oologists' Record, a new quarterly, edited by Kenneth L. Skinner, has made its appearance. In the three parts already issued, there are papers devoted to egg-collecting, etc., in East Africa, the Western Front, Palestine, etc., with an occasional note relating to Britain, the most interesting being in the September issue on 'A remarkable Cuckoo Coincidence,' by G. J. Scholey. We don't anticipate that there will be a sufficient demand to make *The Oologists' Record* a large one!

The Lancashire and Cheshire Naturalist for September-October, published, according to the wrapper, on December 2nd, was probably issued somewhere about December 26th, as, in the first note, the Editors refer to the Studies of the Arctic *Fern* in South Lancashire, as compared with the Common *Ferns*, and as the word occurs four times in half a dozen lines, it can hardly be a misprint. What are Arctic *Ferns* and Common *Ferns*?

In *The Annals and Magazine of Natural History* for December, Messrs. G. K. Gude and B. B. Woodward give 'Some Emendations to their Recent Paper 'On *Helicella* Férussac.' They conclude: 'Despite the yet further complication introduced by Gray in 1847, when he made "*Trachideia* [sic], Brown, 1827," a sub-genus of *Theba*, and cited as type "*Helix elegans*," we consider that Brown's *Trachideia* cannot be taken to refer definitely to either *H. fulva*, or *H. elegans*, and should be allowed to disappear from molluscan literature.'

THE YORKSHIRE NATURALISTS' UNION'S SIXTIETH ANNUAL REPORT FOR 1921.

(Presented at Hull, December 3rd, 1921).

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The Fifty-Ninth Annual Meeting was held at Bradford on Saturday, December 4th, 1920. A full report of this meeting appeared in *The Naturalist* for January, 1921 (pp. 33-47). The Presidential Address on 'The Rigidity of North-west Yorkshire,' was delivered by Prof. J. E. Marr, D.Sc., F.R.S., and has since appeared in our journal (pp. 63-72).

At the same meeting the resignations of the Joint Secretaries, Dr. T. W. Woodhead, M.Sc., and Mr. W. E. L. Wattam, were accepted with much regret, and votes of thanks and appreciation for their long services in the cause of the Union were unanimously accorded to them.

In the early days of January, the Executive learned with great sorrow that the health of the new President, Mr. H. H. Corbett, had not improved, and on January 5th, news was received of his death. Interment took place at Doncaster on January 8th, the Union being represented by Messrs. Bayford, Porritt, Sheppard, Stiles and Woodhead. An 'In Memoriam' notice appeared in *The Naturalist*, April, 1921.

President.—At an Executive Meeting held in the Philosophical Hall, Leeds, on January 29th, 1921, Mr. H. B. Booth, F.Z.S., M.B.O.U., was unanimously elected President of the Union. The Executive has to record its high appreciation of the personal interest taken by Mr. Booth in the field and other meetings throughout the year.

Secretaries.—At the above meeting, Messrs. F. A. Mason, F.R.M.S., and W. H. Pearsall, M.Sc., F.L.S., were elected joint Secretaries. The Executive takes this opportunity of congratulating Mr. Pearsall upon the honour since signalled by the University of Manchester, in conferring upon him the degree D.Sc., for his work on the 'Vegetation of the English Lakes.'

Field Meetings have been held as follows :—

- South Cave (Easter week-end).
- Dent (Whit week-end).
- Redcar (June 11th to 13th).
- Wentworth (Thursday, July 7th).
- York (Bank Holiday week-end).

Reports of these meetings have appeared in *The Naturalist* during the year.

Additional Sectional Meetings have been held by the Mycological, Marine Biology, Bryology and Galls Committees respectively, as referred to in the body of this Report.

In spite of the difficulties of travel imposed by the Coal Strike in the earlier parts of the summer, and the continuance of high railway fares, these meetings have been satisfactorily attended. With the better service now being maintained by the Railway Companies and the resumption of the special reduced fares to members of the Union, which it is anticipated will be in operation next year, it is hoped that the excursions will in future revert to their pre-War popularity.

The Excursions for 1922.—

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| Yorks., | S.W. | Easter (April 15-17)—Clitheroe for Bowland. |
| " | W. | May 13—Bingley. |
| " | N.E. | Whitsuntide (June 3-5)—Thornton Dale. |
| " | S.E. | July—Filey. |
| " | N.W. | Bank Holiday (Aug. 5-7)—Buckden for Walden and
Bishopdale; Fungus Foray, September, Buckden.
Annual Meeting, December, Scarborough. |

In addition to these Excursions, there will be one or more Joint Excursions with the British Association during its meeting in Hull, September 6-13, particulars of which will be announced in due course.

Membership.—There has been a satisfactory increase of new members during the year but in view of the present high working expenses of the Union, the Executive hopes that its efforts to obtain further new members will be aided. A letter to the press outlining the Aims and Objects of the Union, published in the early part of the year, resulted in the addition of twenty members. The membership now stands at 425, the following having been elected during the year :—

- Allison, Miss Harriet Evelyn, The Training College, Bingley.
 Anderson, F., Ashfield, Bradford.
 Asleton, J. H., Newlands, Todwick, Nr. Sheffield.
 Astley, Capt. H. Carr Laund, Nelson, Lancs.
 Barlow, Charles, Kingsley Villa, Pately Bridge.
 Barringer, Leslie, 59 Upper Albert Road, Meersbrook.
 Blackshaw, J. Tremayne, 38 Hill Gate, Doncaster.
 Booth, Harold Almgill, Ainthrope, Danby, Grosmont.
 Bradley, A. E., 8 Shaftsbury Avenue, Roundhay, Leeds.
 Bramley, Willis Geo., Manor House, Fairburn, Ferrybridge.
 Burniston, Norman Arthington, 'Wheatfield,' Farnley, Leeds.
 Butcher, R. W., Botanical Dept., University, Leeds.
 Butterfield, J. A., M.Sc., F.G.S., Shipley.
 Collinge, Walter E., D.Sc., M.Sc., F.L.S., M.B.O.U., The Museum,
 York.
 Cresswell, Lionel, J.P., The Hall, Burley-in-Wharfedale.
 Crowther, Henry, F.R.M.S., Philosophical Hall, Leeds.
 Dallman, A. A., 17 Mount Road, Higher Tranmere, Birkenhead.
 Davis, Miss E. C., 20 Reginald Terrace, Leeds.
 Drake, Walter, 10 Lyell Street, Scarborough.
 Elwess, W., 66 Thorne Road, Doncaster.
 Ewing, James, D.Sc., Botanical Dept., University, Leeds.
 Fleet, Doris, B.Sc., Lynwood, St. Paul's Road, Mirfield.
 Fearnley, W. F., Oxford Street, Guiseley, Leeds.
 Gladstone, Major R. M., The Hollins, Grosmont, York.
 Gordon, Adam, Duncombe Park Estate, Helmsley.
 Hastings, Cuthbert, 29 Brown Street, Bradford.
 Hield, Philip, 21 Churchwood Avenue, Far Headingley, Leeds.
 Hield, Mrs. P., 21 Churchwood Avenue, Far Headingley, Leeds.
 Horrell, E. Charles, 23 Victoria Terrace, Belle Vue Road, Leeds.
 Horsfall, Rev. M. A., Ingleby Greenhow Vicarage, Great Ayton. S.O.,
 Yorks.
 Huntriss, Miss L., 25 Savile Crescent, Halifax.
 Mosley, Charles, 24 Upper George Street, Huddersfield.
 McIlroy, Miss R., 1 Wentworth Street, Huddersfield.
 Percival, E., B.Sc., Zoological Dept., University, Leeds.
 Pilkington, Miss E. W., 63 First Avenue, New Wortley Leeds.
 Priestley, Mrs. M. E., 2 Balmoral Terrace, Shaw Lane, Headingley,
 Leeds.
 Rankin, Wm., M.Sc., Principal, Municipal College, Burnley.
 Seaton, J. Arnold, Ringswood Grimscar, Huddersfield.
 Sewell, Walter, 'Abshott,' Newby, Scarborough.
 Smith, Thomas, 28 Lyme Street, Stockport.
 Stoddart, Miss M., B.Sc., 34 St. John's Avenue, Bridlington.
 Sunderland, Miss Dorothy M., B.Sc., 41 Horton Grange Road,
 Bradford.
 Thomas, Elton, Hazelwood, Hebden Bridge.
 Turner, W., 11 Bentley Street, Bradford.

Veale, H. de P. B., M.D., J.P., Carlton House, Ilkley.
Versey, H. C., M.Sc., The University Leeds.,
Walker, Jeffrey, 'Parkmount,' Baildon, Shipley.
Watson, H., F.G.S., F.C.S., Brastone House, Beckersmet, Cumberland
Williams, Miss Minnie P., Derwent Hotel, Yorkersgate, Malton.
Woffenden, Miss L. M., M.Sc., Botanical Dept., University, Leeds.
Zimmerman, W. G. F., 7 Portland Street, York.

Affiliated Societies.—The Affiliated Societies have been increased by 1, viz., the Berry Brow Naturalists' Society, Huddersfield, with a membership of 30; the total numerical strength of the Union is now 3085.

Obituary.—We much regret to have to record the deaths of the following Members:—Lady Carlisle, J. W. Barry, H. H. Corbett, J. W. Carter, J. Gardner, Sir Wm. Garforth, W. Herdman, F. Arnold Lees, Thomas Ward.

The Divisional Secretaries have continued to facilitate the work of the General Secretaries, and the Executive have to acknowledge their indebtedness to them for their assistance in organising the excursions.

General Committee.—The following have been elected members of the General Permanent Committee of the Union:—C. F. Procter, W. R. Grist, B.Sc., and W. S. Bisat.

VERTEBRATE ZOOLOGY SECTION.

West Riding (H. B. Booth):—The chief ornithological event this season was that an immature White-tailed Eagle had taken up its quarters last winter in the wild stretches of moorland in the extreme south-west of this Riding. It remained in the district for two or three months; when it was unfortunately shot by a gamekeeper, just over the Derbyshire border, on February 8th, 1921.

Other records were:—An Osprey at Southwaite, in Nidderdale; a pair of Hen Harriers; an adult male Crossbill in May; the nesting of the Short-eared Owl (all in Wharfedale). A Waxwing at Hebden Bridge; a Red-throated Diver and a Knot at Selby; a Spotted Crake near Keighley; the nesting of the Water Rail, and a nest of the Common Linnet containing two eggs of the Cuckoo, near Wilsden. All the above items have been described in *The Naturalist*.

The small colony of Lesser Black-backed Gulls again frequented the 'moss' at the side of Malham Tarn and nested. The gamekeeper thought there would be a pair or two more than in 1920. When I was there the young had hatched; but I calculated that there would be about six or seven pairs nesting. The gamekeepers on the adjoining moors are now giving them warmer receptions, as was only to be expected. An additional nesting station of the Black-headed Gull has been added to our list, viz., on Greensett Moss, Whernside (*The Naturalist*, 1921, p. 279), and this season about ten or a dozen pairs attempted to found a colony on the Lanshaw Dams on Rombald's Moor, near Burley-in-Wharfedale. Owing to the dry season the water receded, and most of the eggs were taken as they were laid. By June 12th they had dwindled to three pairs, and I believe that only a single pair succeeded in bringing off its young. A pair of Buzzards frequented the neighbourhood of Crummock Dale, near Austwick, during the first three months of this year, and were last seen on April 2nd (Chris. A. Cheetham*). On May 1st, Mr. Edmondson and the writer made an exhaustive search in order to find if they were nesting there, but we failed to see anything of them at all. It is reported

* The names in parenthesis are the authorities.

that some, if not all, the Eshton Herons have this year left Lords Wood, and have nested in the High Wood, at Flasby, in the same neighbourhood. A Great Crested Grebe (or possibly two) frequented Malham Tarn for most of the year (A. Ward). When I was there on July 16th, there were two Great Crested Grebes; but I could not see any signs of young, or of breeding. In fact the birds did not behave as though they were a pair; but three parties out fishing in boats may have partly accounted for their behaviour. A pair of these Grebes frequented Chelker reservoir (near Addingham) during April (C. A. Cheetham), but did not remain to nest there (J. L. Illingworth). A Jay was seen on January 1st near to Bolton Abbey (H. T. Bates), and in the spring two were seen about the same place for several weeks, and appeared likely to nest there; but it is feared that one of them was shot (T. Roose). A Grasshopper Warbler 'reeled' on most evenings throughout June at Farnley, within the city boundary of Leeds! It is thought that hay-making operations may have driven it away (Chris. A. Cheetham). Rather curiously a Grasshopper-Warbler 'reeled' continuously for a few hours on the Rhyddings, just above Ilkley, on the evening of June 29th, and I never saw or heard it either before or after that date. Was it the driven-away Farnley bird that had taken up its quarters at Ilkley for one night? Swallows have been rather scarcer than usual this year; but as they appeared to have enjoyed a favourable nesting season, it is to be hoped that they will return in larger numbers next spring. After several poor seasons, Red Grouse have had an exceptionally good year, excepting in the extreme north-west of the Riding.

Later Mr. L. Gaunt informed me that Woodcocks have been very numerous in Bolton Woods (Wharfedale) this year, and Mr. R. Chislett reports that throughout August an Osprey occupied the same ground in the extreme south-west of the Riding as had been occupied by the White-tailed Eagle earlier on.

East Riding (E. W. Wade):—The feature of the season has been the abundant sunshine, a record as far as the present generation can remember. After the heavy frost during the third week of December, 1920, followed a very open winter, with sufficient rain until mid-March, a heavy snowfall with frosts occurred in mid-April, but the rest of the year until July was very dry. On the wolds about Bempton there was no rain worth naming from February to July. The effect of the unusual sunshine was very marked. The resident and partially migratory species were early in nesting, and with few exceptions the season was an unusually early and favourable one, full and strong broods were reared, casualties were few, and some remarkable instances of second and third broods were recorded. The migrants left early, with practically no stragglers.

Peewit's eggs were observed on the Wolds in March, but the drought seems to have prevented many birds either from nesting or rearing young. A keeper with a long experience says that on the Wolds their numbers are not one third of what they were before the war. The full time protection extended to the species has aroused much opposition among shooting men, but I have the testimony of a Holderness farmer as to the welcome accorded to it by observant people. He says he has known a turnip field saved from destruction by grubs through the good work of Peewits. Rooks were early and laying full clutches. Young were hatched on 24th March, a record for this part of the county, as far as I am aware. The farmers complain of the damage done by this bird to the crops, and the writer, with a friend, tried the experiment of clearing out every egg in a rookery on 26th March, when 164 eggs were taken. On 23rd April the nests were again cleared of eggs and young, after which no more breeding was attempted. The Corvidæ were, generally speaking, early, and prolific, with the exception of the Jackdaw, which seems to have been affected by the drought, as small clutches were laid.

The breeding of the Owls is again normal, field mice and voles being plentiful. A Barn Owl was seen brooding five eggs in the same hollow as a Jackdaw sitting on five eggs. Ring Doves were nesting on 1st April, and the breeding season extended to September. Migrants arrived at the average dates, apparently unaffected by the unusual amount of sunshine, with the exception of the Spotted Flycatcher, which arrived on 30th April, about a fortnight earlier than usual, and was generally double brooded. The birds, however, were scarcer than last year, many old haunts being unoccupied. The Cuckoo arrived on 6th April. A Skylark with young was observed on 26th April, a Tree-creeper with young on 8th May. Among the Finches the breeding date was markedly early. Greenfinches were nesting by 10th April, but the most abnormal effect was observed in the Goldfinch, generally a late May breeder hereabouts. This season the birds were building on 1st May; eggs were observed on 7th May, and the young flew from the nest on 28th May, when in an average season the birds would be commencing to sit. Whether owing to the prevention of netting, or the abundant crop of weeds produced during the war, and after, the species shows a most wonderful increase all over the East Riding, having nested in localities where it has not been seen before, rearing always two broods, and in one authenticated instance three broods, the last clutch of eggs being completed on 23rd August. The Swallows and Martins show puzzling discrepancies. In some districts Swallows are up to the 1920 numbers, and in others distinctly scarce. The House Martin is decidedly below the average. Swifts arrived early, and show no diminution. Evidently some adverse influence is at work among the Swallows, which, up to 1919, were increasing. Generally they have been double brooded, but no third broods were observed, and all disappeared in good time. The Whinchat shows no further decrease. Corncrake—12 pairs were recorded for the district, most of them in fields where they would be mown out. The Goldcrest is now back again in all its old haunts, but not in pre-war numbers. The Spurn watcher reports that the period of incubation was sensibly shortened owing to the warm sunny weather. Razor Bills were laying at Bempton in April. Grey Crows were about the Spurn promontory and in Lincolnshire all the summer. The Little Owl has extended its breeding range to Driffild this year. There is a poor report of the Stone Curlew on the Wolds this year. The bird appears to be decreasing. A Quail was shot at Ganton first week of September, 1921. A Reeve was shot in the Lambwath 8th October, 1920. A Marsh Harrier female, immature, was shot on Cliffe Warren in November, 1920. A Little Stint was seen at Bridlington on 8th January, 1921. A Bittern was seen on Hornsea Mere on 11th January, 1921. Two pairs of Gadwall in Hornsea Mere on 9th June, 1921. Nine Dotterel at Kilham on 27th May, 1921. The Pink-footed Geese were at Broomfleet in the third week of March, 1921, and the first flock returned to the Humber on 28th August. At present there are thousands about the Humber area. On 20th August a White Kittiwake was seen in Bridlington Bay by Mr. F. Boyes and Mr. T. Audas, and photographed by Mr. Sidney H. Smith 3rd to 17th September. Among the Fulmars at Bempton this year were two which were changing the brown immature plumage of the upper parts for the French grey of maturity. Quite a good breeding stock of Partridges remained after last shooting season, but in spite of an ideal year, the usual fate befell the young broods in most of Holderness. In some localities it is a bumper year, but on the average coveys are small and sometimes only old birds visible, whilst quite a number of second broods have been seen. There seems to be some element always at work to destroy eggs or young in Holderness. Young Pheasants were seen as early as 8th May, but many eggs have been found deserted and unhatched, the dry weather apparently having made the membrane too leathery for the chicks to break through.

North Riding (W. J. Clarke):—Thanks to protection, Goldfinches are now quite common in most suitable districts about Scarborough, and are said to be increasing in the Whitby area. Two pairs of Pied Flycatchers nested near Scarborough. Spotted Flycatchers were numerous in all suitable places. Siskins and Stonechats occurred in small numbers near Whitby. Whinchats were scarce about Scarborough, but have resumed their former status around Whitby. Common Redstarts were abundant; a single Black Redstart was seen at Whitby during January and February. Grasshopper Warbler occurred near Whitby in May. Swallows, House Martins, Sand Martins and Swifts came in their usual numbers, the first Swift being seen on April 30th—an early date. Waxwings visited the district in small numbers during January and February. Three stayed three weeks at Ayton, a flock of thirty made a prolonged stay at Thornton Dale, several were seen near Scarborough, and small numbers occurred at Whitby. Kingfishers frequented the streams in normal numbers, being somewhat more numerous than usual in the Whitby district. A pair of Quails nested near Hunmanby, where the birds were reported as breeding last year. Landrails were normal in numbers in the neighbourhood of Scarborough. A Spotted Crake occurred at Whitby on September 27th. Turtle Doves are extending their range and becoming more numerous. A Great Grey Shrike was seen at Whitby from April 13th to 20th. A Green Sandpiper was near Scarborough on May 3rd. Several Greenshanks were at Whitby. An adult Teal was on a pool on the Whitby Moors, and subsequently three nestlings were also seen on the same water. Four broods were hatched near Whitby. Four Velvet Scoters were seen on the wing off Scarborough on September 22nd, an adult male at same place from October 8th to 15th. A flock of Grey Geese, forty-seven in number, passed over Scarborough on October 13th, too high for identification. An adult male Shoveller occurred at Whitby on June 10th, and an immature male Pintail near Northallerton in January. Black-headed Gulls nested late on Fouldsyke. About one hundred birds, twenty nests, only four of which contained eggs, were noted on May 11th; thirty nests, most with eggs, and one containing young, were seen on June 14th. Lesser Black-backed Gulls frequented the Kettleless Cliffs during the spring and summer, but there is no evidence that they nested. An immature Glaucous Gull was seen at Whitby. Fulmar Petrels frequented the Castle Cliff at Scarborough during June and July, but were not observed to nest. An adult male Great Northern Diver was captured at Cattleton on November 1st. Three Goosanders were seen near Scarborough in February, and two at Whitby. Two pairs of Merlins nested on the moors near Whitby. A female Peregrine Falcon was seen at Forge Valley on July 22nd.

The recorder is indebted to Messrs. F. Snowdon of Whitby, and Arnold Wallis of Scarborough, for notes which have been of assistance in compiling this report.

York District (Sydney H. Smith):—Local game preservers have had record coveys of Partridges, and other species of game also show to good advantage. Our summer visiting birds were, on the whole, late in arriving in their usual haunts, and it is noticeable that Swallows, Martins and Swifts are again very scarce compared with other years, and the Landrail is also becoming rarer. I am again indebted to Mr. S. J. F. Zimmerman for many useful notes, and to Mr. E. W. Taylor for notes of the arrival of migrants.

Jan. 8.—Thrush first heard singing at York.

„ 10.—Great Spotted Woodpecker shot at Clifton, York (G. E. Gibbs).

„ 28.—Little Grebe seen on the River Foss near Monk Bridge, York.

I also saw one in breeding plumage near the same place on August 30th, and for several days after.

- Feb. 14.—A pair of Great Crested Grebes and several Tufted Ducks on the lake at Dringhouses. Rooks commenced repairing nests in some trees in the City.
- „ 19.—Hen Harrier female killed at East Cottingwith.
- „ 20.—Woodcock seen at Sandburn.
- Mar. 26.—Yellow Wagtails seen at Leeming Bar (H. Houseman).
- April 1.—Chiff Chaff arrived at Skelton.
- „ 9.—A pair of Hawfinches at Castle Howard (E.W.T.)
- „ 10.—Blackcap seen and heard at Heworth, May 5th, York (E.W.T.)
- „ 13.—Willow Warbler seen and heard at Heworth, May 5th, York (E.W.T.).
- „ 15.—Cuckoo arrived at Fairfield; 19th, Huntington; 28th, Knavesmire; 21st, Askham Bog; May 7th, Heworth.
- „ 18.—Swallows arrived at Dringhouses; 19th, Strensall; 23rd, York and Stamford Bridge.
- „ 18.—House Martin, Dringhouses.
- „ 20.—Long-eared Owl nest and eggs and young at Strensall, and a Carrion Crow's nest with eggs.
- „ 24.—Curlew, three pairs seen at Strensall; visited nesting boxes at Sandburn. One had a nest of Great Spotted Woodpecker; others contained nests and eggs of Blue Tit and Coal Tit, and all the others were being supplied with nesting material by species that were not determined.
- „ 24.—Tree Pipit seen at Dringhouses, and again on the 28th.
- „ 27.—Several nests with eggs of Redshank and Snipe at Wheldrake.
- „ 30.—Landrail arrived Stamford Bridge; May 8th, York (E.W.T.); May 1st, Cottingwith.
- „ 30.—Sand Martin arrived Stamford Bridge; May 13th, Grimston.
- May 1.—Swift arrived East Cottingwith; May 7th, York (E. W. T.); May 8th, York (S.H.S.).
- „ 4.—Black-headed Gulls very numerous at Skipwith, and nests and eggs of Mallard, Teal, Shoveller, Tufted Duck, Pochard, Redshank, and Snipe were seen.
- „ 5.—Wood Warbler seen at York.
- „ 7.—Sedge Warbler seen at Askham Bog; May 13th, Grimston.
- „ 10.—Wheatear nest and eggs at Dringhouses.
- „ 13.—Whinchat seen at Grimston.
- „ 15.—Nests with eggs of Hawfinch and Goldfinch seen at York.
- „ 16.—Nightjar heard at Sandburn.
- „ 22.—Woodcocks nest with young birds seen at Sandburn.
- „ 22.—Nest of the Redstart built on the ground found at Strensall (V.J.F.Z.)
- June 2.—Heard the Nightingale at Harton Woods.
- „ 2.—Swallows were very numerous at Sutton on Derwent.
- „ 3.—Turtle Dove seen at Dunnington; Raskelf, June 11th; Thormanby, June 11th; Stillington, June 12th. A nest with two young ones found at Sandburn on June 20th, and another nest with young birds at Dunnington, June 29th.
- „ 5.—Curlew. Two young ones found at Strensall by Mr. T. Grey.
- July 1.—Pied Flycatcher. A nest with three young ones was found in the same nesting hole as in previous years at Newton Kyme.
- „ 1.—Turtle Dove, nest with young in a yew tree, Newton Kyme. A Turtle was also seen at Bramham Park on August 6th, and one at Raskelf on September 1st.
- „ 30.—Freshly killed Little Owl seen at Fulford on the Yorkshire Naturalists' Union Excursion by H. B. Booth.
- Oct. 16.—Starlings. I saw immense flocks of these birds near Ganton about four o'clock in the afternoon. They were all proceeding east, the weather being very fine and settled.

MAMMALS, AMPHIBIANS, REPTILES AND FISHES COMMITTEE.

Mammalia (Sydney H. Smith) :—Barbastelle Bat : further records of this new Yorkshire species appear in *The Naturalist* for November, 1921 (H. B. Booth). Natterers Bat (see *loc cit*, November, 1921, H.B.B.). Daubentons Bat, previously recorded as the Whiskered Bat, at Helmsley (see correction in *loc cit*, November 1921, H.B.B.). Pine Martin in Yorkshire (see Mr. W. H. St. Quintin's notes *tom cit*, January, 1921, pp. 3-4). Pine Martin in Wharfedale (notes by Riley Fortune *tom cit*, February 1921, pp. 73). Pine Martin, early Yorkshire records (notes by H. E. Forrest, August, 1921, p. 286). Wild Rabbit (notes on food, by W. E. L. Wattam, August, 1921, p. 318). Rabbits and Hares, damage done by (see notes by F. D. Welch, October, 1921, p. 342). Grey Squirrel : Mr. Booth states this species appears to be ousting the Red Squirrel at Castle Howard ; one that had been trapped was secured by Mr. A. E. Peck on October 3rd during the Yorkshire Naturalists' Union visit. Otter : one shot on the Derwent at Hackness in June is reported by W. J. Clarke. Common Roqual : Mr. Clarke reports one twenty-seven feet in length as having been washed ashore dead and decomposed at Scarborough on September 30th.

Reptilia and Amphibia (Sydney H. Smith) :—Grass Snake at Harrogate and Ripon (Riley Fortune, *The Naturalist*, April, 1921, p. 134). Palmated Newt, H. B. Booth states that young ones, one inch in length, were common in small pools on Ilkley Moors during February and March. They still had external gills or trachea, although they are said to leave the water in the autumn.

Pisces (Sydney H. Smith)—

Sturgeon at Whitby.—F. Snowden (see *The Naturalist*, p. 182 and p. 328).

Pike.—One of 23 lbs. was caught in the Derwent at Elvington on February 26th. Length 40½ in. ; girth, 22½ in., *tom cit*, November, 1921.

Barbel.—One of 9 lbs. was caught at Wheldrake on October 1st, *tom cit*, November, 1921.

Gudgeon.—7 in. long, weight 2 ozs., caught in the River Leven, September 8th, *tom cit*, November, 1921.

Perch.—Two weighing together 5 lbs., caught near York, September 20th, *tom cit*, November, 1921.

Stone Loach.—This species is rare in the York district, but on July 7th large numbers were destroyed in Tanghall Beck owing to the drying of the watercourse.

Piked Dogfish or Spur Dog (*Acanthias vulgaris*) near York.—A specimen of this two spined dogfish was caught in the tidal water below Elvington dam in the River Derwent by an angler named J. Hobman, of York, on October 16th, 1921. The specimen measured 19 in. in length, and was caught on fine tackle baited with a small red worm. The river at this point is quite fresh and about sixty miles from the sea. I have carefully inquired into the circumstances, and believe the capture is quite authentic. The dogfish itself is being preserved to the order of the York and District Amalgamation of Anglers.

WILD BIRDS AND EGGS PROTECTION COMMITTEE.

Stone Curlews do not seem to increase in numbers, although there has been a fair number of both old and young ones seen in both North and East Yorkshire. Some Stone Curlews have been breeding on new ground for the first time. The following birds have done well, viz., Goldfinches, Woodpeckers and Kingfishers.

Scarborough Mere will now be of little use for breeding ; the smaller Mere, where Coots used to breed, is to be added to the large Mere.

West Riding.—Only one young Peregrine has got away. When the Yorkshire Naturalists visited these breeding quarters, two young Falcons were hatched, but what became of them is not known.

Bempton.—A very similar report to last year. No eggs have been found, although some people say the Falcons were about. More Fulmers about this year, but none have been known to breed.

Hornsea Mere.—Unfortunately our old watcher here has been obliged to discontinue, but his son has been able to take it on. This has been an exceptionally good season for all birds in this district. Trespassers were far too frequent during the month of May.

Spurn.—This year the tides have been very low, consequently eggs have hatched out well. Egg gatherers were too plentiful, however. Posters had to be put up again at the Batteries, Kilnsea, and Easington Post Office. Taking altogether, it has been a most successful season.

BALANCE SHEET.

RECEIPTS.

PAYMENTS.

	£	s.	d.		£	s.	d.
Balance forward	...	12	15	5	Coates & Bairstow	...	0 15 0
Mr. L. Gaunt	...	2	2	0	J. Taylor, Hornsea	...	10 0 0
Mr. W. H. Parkin	...	0	10	6	J. Green, Thornton D.		3 0 0
Mr. S. H. Smith	...	0	10	0	J. Hodgson, Bempton		1 0 0
Mr. A. Hirst	...	10	0	0	B. England, Nunburn-		
Mr. J. Wilkinson	...	1	1	0	ham		1 0 0
Mr. T. Haxby	...	0	10	6	J. Hodgson, Kilnsea	...	20 0 0
Mr. E. B. Gibson	...	0	10	6	Mrs. Capstick, Dent		2 0 0
Mr. W. N. Chusman	...	0	10	6	Room at Museum, etc.		0 10 0
Mr. W. H. St. Quintin		5	0	0			
Mr. C. F. Procter	...	0	10	0			
Mr. J. W. Dent	...	2	2	0			
Mr. G. Fysher	...	0	5	0			
Mr. W. Mason	...	0	10	6			
Mr. E. Cockshaw	...	0	5	0			
Mr. A. H. Lumby	...	0	10	6			
Mr. J. F. Musham	...	0	10	6			
Mr. Chas. O. F. Saner		2	2	0			
Mr. J. Atkinson	...	1	1	0			
Mr. F. H. Edmondson		1	1	0			
Mr. E. W. Taylor	...	0	5	0			
Mr. J. Y. Granger	...	0	10	0			
Mr. R. Chislett	...	0	10	0			
Mr. H. E. Wroot	...	0	10	0			
Mr. G. T. Porritt	...	0	10	0			
Mr. H. J. Behrens	...	0	10	6			
Mr. H. B. Booth	...	1	1	0			
Miss Waterhouse	...	1	0	0			
Interest, Dec. 31st, 1920		0	3	0			
Interest, June 20th, 1921		0	5	0	Balance	...	9 7 5
		<u>£47</u>	<u>12</u>	<u>5</u>			<u>£47 12 5</u>

Audited by
W. E. L. WATTAM.

CONCHOLOGICAL SECTION.

Mr. Rhodes reports that no additions have been made to the County records, and that the dry summer has been unfavourable to field work.

ENTOMOLOGICAL SECTION.

Lepidoptera (B. Morley).—The past season has been almost as bad for lepidoptera as was the previous one. The effect of the mild winter was such that a large emergence of *Phigalia pedaria* in the Skelmanthorpe district was worn out before the end of January, and in the same month *Hybernia rupicapraria*, *H. leucophaearia*, *H. marginaria* and *Anisopteryx aescularia* all appeared. Subsequently many common species were out two or three weeks earlier than usual. G. T. Porritt found *Acronycta menyanthidis* well out on the Meltham Moors at the end of April, and also found ova of *Hadena glauca* in the first week in May; both exceptionally early dates. Both in Elland Park Wood and Deffer Wood* larvæ of *Triphaena fimbria* were in great abundance during April, as also were those of *Bombyx callunae* and *Agrotis agathina* on a heath near Penistone in June. In May, W. Buckley caught a fine *Cidaria suffumata* var. *porrittii* near Clayton West, at the same time and place I took a female *Cidaria truncata* from which a series of the var. *rufescens* has been bred—a form not previously noted for the county excepting for a specimen taken at Bawtry by Dr. Smart many years ago. In June, *Herbula cespitalis* was taken for the first time in the Skelmanthorpe district, where also about mid-summer *Phoxopteryx myrtillana*, *Tortrix paleana*, *T. viburnana*, *Amphysa gerningana*, *Penthina sauciana*, *Sciaphila conspersana* and *Hedya neglectana* were plentiful, and during September *Peronea sponsana* abounded among sycamore in the South-west Riding. *Hypermezia angustana* was beaten out of sallow at Elland in July. Mr. Porritt notes the abundance of *Carpocapsa pomonana* feeding in apples in his garden at Huddersfield, where he has not previously noticed it, and Dr. Smart notes the capture of *Aplecta occulta* near Shelley in September.

A noteworthy feature of the hot summer has been that the heat has stimulated many species into two and, in a few cases, even three broods. On the moors, in the middle of August, *Anarta myrtilli*, *Phycis fusca* and *Acronycta menyanthidis* were out in some numbers in second broods, when a fine melanic form of the last named was found, a very unusual occurrence with this species on the South-west Riding moors. *Pionea forficalis* appeared twice, and Dr. Smart noted a partial third brood of *Scoparia murana* and a plentiful third brood of *Symaethis oxycanthea* was out in early September near Skelmanthorpe. Dr. Smart also had a complete second brood of *Smerinthus populi* reared out of doors entirely.

In the West Riding the three 'Whites' have never even been numerous, *Polyommatus phaeas* has always been about all the summer, seemingly continuous brooded. *Lycaena icarus* became very common near Skelmanthorpe by the middle of June, and a specimen taken on September 18th almost suggests a third brood of this species. During September, also, *Vanessa urticae* V. 10, *V. atalanta* and *V. cardui* were plentiful in many parts of the West Riding. Recently, T. H. Fisher, of Skelmanthorpe, gave to me a specimen of *Incurvaria tenuicornis* taken near his house in June, 1919, this being the third recorded specimen for the county, and he also gave me a specimen of *Chrysoclista bimaculella* taken near Penistone in June, 1919, only previously recorded for Yorkshire from York.

Coleoptera (W. J. Fordham):—As far as is known at present, twelve species can be added to our list; 2 from Cleveland, 7 from the Scarborough District, one from West Yorks, and two from the East Riding. Of outstanding rarity is the beetle *Heptaulacus villosus* Gyll. taken by M. L. Thompson at Redcar. The brilliant *Carabus nitens* L. has turned up again this year in various localities, as also its moorland

* In Deffer Wood, also, larvæ of *Xanthia aurago* were common in May.

associates *Pterostichus lepideus* F. and *Miscodera arctica* Pk. in some new stations. The re-appearance of the curious water beetle *Pelobius tardus* Hbst. in the Hull district, after many years, is worthy of special mention, as is also the extended distribution in the same district of *Dytiscus circumflexus* F. first recorded last year.

Diptera (Chris. A. Cheetham) :—In the report for 1920, the story of a summer lacking sunny days was used to explain the scarcity of some sun-loving groups of diptera, the past summer has erred on the other side, and a lack of moisture may be the cause of a similar scarcity, for a degree of moisture is necessary to enable some flies to emerge from the pupal state.

Again the Syrphids have been less frequent than in 1918/19, with the exception, as last year, of those with aquatic larvæ; the Limnobiids and fungus gnats have certainly been less plentiful than in 1920, and some species of the former group, which were abundant in definite habitats then, have not been met with this year, though careful search has been made; also several of the larger Tipulids have not appeared in their usual numbers.

On the other hand, all who were present at the Wentworth meeting will agree that it would be hardly possible to get a larger number of a single species, *Hydrotæa irritans*, than were present on that occasion; many notes have appeared in the daily press about plagues of mosquitoes, possibly these refer to *Culex pipiens*, which has been abundant at Farnley this autumn, and certain Chironomids also appeared in great swarms.

As a result of the year's work, about 300 species have been added to the list and, as may be seen in F. W. Edward's paper in the *Entomological Society's Transactions*, some of these are additions to the British list.

Hymenoptera (R. Butterfield) :—Spring was not unfavourable for the Aculeates, but during the prolonged drought which followed, insects of this group were not much in evidence, except the Fossores. No new species are added, but a few previously resting on slender authority have been substantiated. A. E. Bradley has continued his observations on the social bees, and has met with interesting varieties. Several nearly black males of *Bombus hortorum* were taken at Scarcroft. He took half a dozen males of *Bombus distinguendus* on heads of spear thistle at or about Roundhay and Scarcroft. In May I noticed queens of *Bombus jonellus* and *B. lapponicus*, on flowers of bilberry, at Embsay and near Harden.

Agonia variegata, one of the Pompilidæ, was found preying on spiders which frequented an old oak stump at Shipley Glen. On September 2nd last, I examined underground sites of eight wasp-nests in the High Wood at Grassington, and was surprised to find they were all deserted. Entrances to other deserted nests were seen. The woodman who accompanied me said the tenants cleared at the latter part of August. The early dispersion of the queens, and the smallness of the nests in this dry, elevated wood, were probably due to the long drought.

H. H. Wallis has paid some attention to Ichneumons. I bred a tiny ichneumon which is parasitic on eggs of the oil beetle, but have not been able to ascertain whether it is known or not. I also bred a tiny ichneumon formerly known as *Theocolax formiciformis*, parasitic on the furniture beetle (*Anobium*).

Neuroptera (G. T. Porritt).—Practically nothing new or of interest had been done in this order. He had found a considerable colony of the Dragonfly *Pyrrosoma nymphula*, on Harden Moss, and *Chrysopa perla* was not uncommon in Honley Wood, both new to the Huddersfield area, but plentiful enough in the county generally.

Arachnida (Wm. Falconer) :—Collecting during the year has been more of a casual nature than a systematic search. Chris. A. Cheetham records in the May issue of *The Naturalist* (p. 167) several species incidentally sifted from moss at Austwick; one, *Lophocarenum*

nemorale Bl., being new to V.C. 64, and another, *Panamomops bicuspis* Camb., scarce in the county. Examples of *Dysdera crocata* C. L. Koch, a 'Mediterranean' species, have turned up at Selby (W. N. Cheesman and J. F. Musham), at Scarborough (D. W. Bevan), and near Huddersfield, the last (with its egg sac) from a bunch of Canary bananas. Mr. Bevan later sent a female *Pisaura mirabilis* Clerck (taken at Langdale), a spider of Holarctic distribution and usually plentiful, but in Yorkshire as in some other districts, unaccountably rare. The cave dweller, *Meta menardi* Latr., is reported as being present in Kirkdale Cave (V.C. 62) by Prof. Watson; two male *Evarcha falcata* Bl., not a common or widely distributed spider in the county, were taken in Deffer Wood, Cawthorne; *Epeira patagiata* C. L. Koch, *Hillhousia misera* F.O.P.Cb., and the water spider still remain on Skipwith Common. The 'Spiders of Yorkshire' has run serially through *The Naturalist*, and will shortly be concluded.

Satisfactory progress continues to be made in the investigation of the mite fauna. Several species have been added to the county list, one being new to science, *Liodynychus winteri* Hull, collected by W. P. Winter, at Shipley, 1919, and described in *The Vasculum*, February, 1921, and another new to Britain, *Histiostoma muscarum* Schrnk., found on a fly at Farnley, Leeds, by C. A. Cheetham. The total of the gall-mites has been sensibly increased, some of the additions being recorded in the accounts of the 'Plant Gall Forays at Leeds,' in *The Naturalist* for August and November.

Early in the year F. A. Mason submitted at different times two living false scorpions, both from Leeds—*Chernes godfreyi* Kew from diseased Begonia roots, which had been sent to him from Cardiff, and *C. dubius* Camb. from under birch roots in Roundhay Park, two very closely allied species. The former has not occurred in Yorkshire, and of the latter only 5 examples have so far been met with, in V.C. 61, 63 and 64.

Plant Galls (Wm. Falconer):—The members of the Union interested in plant galls met twice during the year to work a selected area in the vicinity of Leeds, and the species obtained have been listed in the August and December issues of *The Naturalist*. Records for other districts—Scarborough, York, Selby and Huddersfield—await publication, one of them being for the dipteran *Lipara lucens* Mgn., a local species apparently new to the North of England, which, by the shortening of the internodes, causes a 'cigar' shaped gall on the stems of *Phragmites communis* Trin. Breeding out various gall agents tends to shew the inadvisability of taking anything for granted. The nodal swelling of the twigs of the birch has always been thought to be due to the moth, *Epiblema tetraquetra* Haw., but an example of this kind taken from Honley Old Wood, near Huddersfield, produced *Chrysoclista aurifrontella* Hb., quite an unexpected and previously unknown yield. In the same wood on the same bushes there are sometimes slight but distinct lateral swellings of the internodes, each tenanted by a yellow, tinged with red (especially at extremities), dipteran larva, which seems to have escaped the attention of naturalists, at least as a gall agent. Again, in British gall-books, the 'cigar' shaped gall of the couch grass is assigned to one or other of the diptera. *Chlorops taeniopus* Mgn., or *Lonchaea parvicornis* Mgn., but in the Huddersfield district, the result of four years' breeding out from various localities, the emerging insects have, without exception, been a hymenopteron, probably the Chalcid *Isosoma graminicola* Gir. which affects *Agropyrum* spp. on the Continent.

Messrs. Bagnall and Harrison, in *The Naturalist* for October, under the comprehensive title of 'The Midge Galls of Yorkshire,' published a list of the species which have come under their notice, most of the records, however, having reference to V.C. 62, a comparatively restricted area. Other districts supply fourteen additional species, the names of which may be gleaned from the pages of the above journal 1918-1921, while the following, amongst others, have not hitherto been recorded for the

county :—(a) at Slaithwaite, (1) *Perrisia floriperda* K. on bladder campion, (2) *P. schlechtendali* K. on tuberous bitter vetch, (3) *P. vaccini-orum* K. on bilberry, (4) *P. virgae-aureae* Lieb. on golden rod. (b) at Almondbury, Huddersfield, (5) *P. acer crispans* K. on maple. (c) at Cawthorn, (6) *Atrichosema acris* K. on maple. (d) at Slaithwaite, Bradley and Skipwith Common, (7) *Rhopalomyia tanaceticola* Krsch. on tansy.

Attention has been drawn elsewhere to the occurrence of the curious Coccid gall of *Asterodiaspis quercicola* Bché. and of a few rare hymenopterous and un-named mite galls.

BOTANICAL SECTION.

(J. Fraser Robinson) :—Perhaps the remarkably long, dry and fine season, which still continues this second week of October, is responsible for a marked revival or big increase in the activities of the field botanists during the year. On no former occasion could one report the receipt by one at least of your secretaries of so much botanical correspondence, with plant specimens for confirmation, identification and so forth, as has been the case of late. From places as far separate as Goathland and Skipwith, Wensleydale and Brantingham Dale, we have had many plants and numerous lists of plants; and it is pleasing to note that these were from members or associates of the Y.N.U. who, perhaps, have long been interested, although most unobtrusively, in plant study and classification. True, the confirmation of old records and the discovery of new plant-stations have constituted the bulk of the work done, but it has not been entirely without 'new to Yorkshire,' or even 'new to Britain.' The recently found *Tillaea aquatica* in W. Riding and the White Helleborine (*Cephalanthera Damasonium* Druce) in an E. Riding Beechwood on the chalk, are instances in point.

This season has been mentioned; but it has been really a kind of double season. The long drought in the early part thereof, brought forward the flowering period which was consequently soon over. Since then the drought having been broken somewhat, there has been a remarkable vegetative resuscitation with a corresponding flowering period. During the early autumn, many flowers have been almost as much in evidence as they were last spring. Thus White Dead Nettle, the Creeping and Acrid Buttercups, and even Laburnum and Lilac have made a novel sight; whilst in gardens in the E. Riding, a week or two ago, the new Raspberry canes were in flower.

The number of competent observers of the crops of fruit, has been larger than usual; and many reports show that Apple, Pear, Oak, Bramble and Roses have good fruit crops generally. In certain districts the same may be said of Sycamore, Ash, Elm, White Beam and Mountain Ash, although in others the crop of fruit on these is only very fair or fair. Of the Pruni (Sloe, Bullace, Damson, Plum, etc.), the fruiting is very poor or absolutely nil, which will be accounted for by their very cold blossoming time. The same may be said of the Beech tree which has no fruit this season. Horse Chestnuts are scarce; likewise Haws; and shrubs like Dog-wood, Guelder-rose, Yew, Privet, etc., are apparently in the same category. One observer mentions the fact that the Manna Ash (*Fraxinus ornus*) has flowered well within the city boundary of Sheffield during the summer, but he did not discover any fruit.

One cannot write a botanical report without referring to the great loss that this section and the Y.N.U. generally have sustained by the deaths during the year of such able botanists as the late J. G. Baker, L. C. Miall and F. Arnold Lees. Those of us who are still left in the field could say much more on this mournful point. We content ourselves with brief mention in very grateful memory.

W. H. Burrell reports :—Field and indoor meetings have produced useful notes on the relationship of plants to habitat, and show that the

Union is not neglecting the problems of plant distribution ; evidence is accumulating as to the response of vegetation to soil acidity, and the natural sequence of vegetation, which in due course may be expected to form a basis for broad generalisation.

Mr. Wallis' appeal for a closer co-operation between entomologists and botanists, and Dr. Pearsall's vision of the animal Kingdom being involved in ecological studies, indicate the progress of thought within the Union ; Mr. Ben Morley's timely reminder that work on these lines has been in progress for many years only emphasises the advantage that may be expected if team work can supplement individual effort.

The secretaries, past and present, are to be congratulated on their choice of reporters for the field meetings.

Mycology (A. E. Peck) :—At the York Excursion (August Bank Holiday) the Section was represented by F. A. Mason and A. E. Peck. For Report see *The Naturalist*, October, 1921 (No. 777), with photograph of *Claviceps purpurea* Tul., the Ergot of Rye, by F. A. Mason.

The Mycological Meeting at Castle Howard, October 1st-6th, was attended by 20 members and friends. A Report will appear in *The Naturalist*. W. N. Cheesman reports finding *Coprinus picaceus* in Stainer Wood, Selby, on October 13th, 1921, which is, I think, only the third record for the County.

Bryological Committee (F. Haxby) :—The work done through the past year has shown up well. *Weisia curvirostris* C.M. var. *scabra* Lindb. has been found by Mr. Wilson near Sedburgh. Mr. Cheetham brought in *Bartramia Halleriana* Hedw. from Ribbleshead (Lune drainage). Some advance has been made with regard to our knowledge of distribution of many of the smaller of our true mosses.

Mr. J. A. Wheldon's 'Key to the Harpidioid Hypna,' and Mr. J. R. Simpson's 'The Moss Flora of Hagg Wood,' appeared in *The Naturalist* during the year. Observation is needed as to what effect the hot summer has had on the fruiting, etc., of mosses generally.

GEOLOGICAL SECTION.

J. Holmes reports :—The zoning of the Millstone Grits has been continued during the past year. Members of the Carboniferous Rocks Committee attended successful excursions arranged by the Leeds Geological Association to Otley and Silsden. Early in the year beds in the Worth Valley, near Oxenhope, and at the head of Crimsworth Dean, were examined with good results. Marine shales have been noted and fossils collected at Marchup, in Wharfedale, at Eastburn, Thwaites and Parkwood, near Keighley, in Airedale. The Skipton, Huddersfield and Sheffield districts have been re-visited. The shales at Rough Lea on the south side of Pendle Hill have also been examined.

Yorkshire Glacial Committee (J. W. Stather) :—

Brandesburton, Holderness.—The conspicuous mound half a mile south-west of the village, known as Conygarth Hill, has recently been extensively quarried by the Beverley Corporation, and fine typical sections in morainic gravels and sands are now exposed.

Cottingham.—A large new quarry in late glacial or post-glacial gravels has been opened about half way between this village and Dunswell. The cutting into the quarry dips from the road in an easterly direction, to a depth of about 16 feet, and the following section is exposed :—

- | | | |
|--|--------|--------------|
| 1.—Top soil | ... .. | 1 foot. |
| 2.—Irregular clay band | ... .. | 1 to 2 feet. |
| 3.—Gravel and sand, the gravel consisting chiefly of waterworn chalk and angular flints, pebbles of sandstone and other rocks being not uncommon | ... .. | 8 feet |
| 4.—Sand with carbon streaks (base not seen) | ... .. |  | 5 feet. |

South Cave.—The section in the Oolites now exposed west of the railway station exhibits what appears to be glacial phenomena of an unusual character, and is well worth a visit—see *The Naturalist*, June, 1921, p. 214.

Easington, Holderness.—In June last an unusually large area of basement clay was exposed on the beach at Easington and Dimlington. At a point on the beach opposite Easington Windmill, two boulders of shap granite were noted, measuring $3\frac{1}{2}$ ft. \times $3\frac{1}{2}$ ft. \times 3 ft. and $1\frac{1}{2}$ ft. \times 1 ft. respectively. They were within 5 feet of each other, and had obviously recently fallen from the cliff, which is wasting rapidly in this locality.

Coast Erosion Committee.—(J. W. Stather) :—Erosion still continues on the Holderness coast, but we have no unusual particulars to report. The high tides during October flooded the fields between Hornsea Railway Station and the shore, and gave rise to the usual periodic alarming newspaper outburst—but competent observers have nothing unusual to report.

Geological Photographs Committee.—Now that the war is over, and it is no longer a crime to be seen with a camera, the work of the Geological Photographs Committee, so long neglected, should be revived. The Union's collection of albums was exhibited at the Annual Meeting at Hull, on December 3rd, and offers of assistance were made by various members. It is hoped that our next year's report will give some tangible results.

Committee of Suggestions (Chris. A. Cheetham) :—The Peat investigation instituted by this Committee has been kept to the fore ; a programme of lectures was carried through during the winter months, two special field meetings were held at Moor Allerton and Crosshills, and were well attended, all present being enthusiastic and interested in the methods adopted ; at the general meeting of the Union at Dent the high level buried timber on Whernside was carefully examined ; many notes on local peat deposits have been received by the Committee, and in some cases further enquiries are being made on these.

At the October meeting of the Botanical Section, W. H. Burrell gave a resume of the work done on aquatic bryophytes and water hardness, and R. W. Butcher reported the results to date of his monthly examinations of the algæ in the River Wharfe at Harewood Bridge ; these two papers summarize the Union's contribution this year to the Yorkshire Geological Society's River Investigation.

A suggestion of H. H. Wallis that Insect associations should be studied was adopted and a meeting held for consideration of methods ; work has since been started in small areas, and our pages will probably show the results later.

British Association.—As reported in *The Naturalist*, your representative, T. Sheppard, attended the very successful Edinburgh meeting of the British Association, and was present at both the Conferences of Delegates. There was evidence of a distinct revival in the work of the affiliated societies throughout the country. As your delegate was appointed local secretary for the meeting next year, he takes the present opportunity of warning the members of the Yorkshire Naturalists' Union that they will be expected largely to contribute towards the success of the Hull meeting, from September 6th to 13th.

The Naturalist.—The high standard of this publication of the Union has been maintained. Many illustrations have enhanced the value of the Editor's Notes, and his other contributions, and the cost of these has been defrayed by the Editor (T. Sheppard) himself. Mr. H. B. Booth also bore the expense of the blocks used in illustrating his article on 'Yorkshire Bats.'

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EDINBURGH—OLIVER & BOYD, TWEEDALE COURT.

LONDON—GURNEY & JACKSON, 33, PATERNOSTER ROW.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by
A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Jan. 1st, 1922.

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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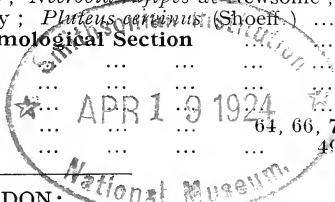
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YORKSHIRE NATURALISTS' UNION

BOTANICAL SECTION.

By kind invitation of Prof. Priestley, a Meeting will be held in the Botanical Department, Leeds University, on Saturday, February 11th, at 3-30 p.m.

The following communications have been promised:—

Mr. F. E. MILSON: 'The Oil Bodies of Liverworts.'

Dr. J. EWING: 'Pine Forests.'

Dr. W. H. PEARSALL: 'Woodlands in the North of England.'

Mr. J. W. H. JOHNSON: 'The Influence of the Drought on the Selection of Flowers by Honey Bees.'

As the evening (6 p.m.) papers deal with the Peat Question, members of the Committee of Suggestions and others are cordially invited.

Miss W. M. BATES: 'Recent Finds of Tree Remains on the Marsden Moors.'

Dr. T. W. WOODHEAD: 'Recent Discoveries of Flint Implements on the Marsden Moors.'

Mr. T. SHEPPARD: 'New Records from the Yorkshire Peat.'

Other communications are invited.

CHRIS. A. CHEETHAM, *Secretary*.

VERTEBRATE SECTION.

President of the Section:—S. H. SMITH, YORK.

Two Meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m. and 6-30 p.m. respectively, on Saturday, February 18th 1922.

Papers will be given as follows:—

'The Pine Marten,' C. F. PROCTER.

'Spring Notes among the Birds of Lapland' (Illust), H. POLLARD.

'The Economic Status of Wild Birds' (Illustrated), WALTER E. COLLINGE, D.Sc., M.Sc., F.L.S., M.B.O.U.

'The Hooded Crow and the Whimbrel in their Breeding Haunts' (Illustrated), R. CHISLETT.

Any Member or Associate of the Yorkshire Naturalists' Union is invited to attend, and bring notes, specimens, lantern slides, etc.

Will Officers of Affiliated Societies kindly notify their members?

E. WILFRED TAYLOR, *Hon. Sec.*,
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BOOKS WANTED

Lancs. and Cheshire Antiq. Soc. Vols. IV., V., VIII., XXVI.

Louth Ant. and Nat. Soc. Reports, 1-12, 19.

Liverpool Marine Biological Com. 1st Report.

Liverpool Geol. Association Proc. Parts 1, 3, 16.

Liverpool Nat. Journ. Parts 1, 3, and 20.

Manchester Geol. Soc. Trans. Vols. XV., XVI., XXIII.

Marine Biological Assoc. Journal. Vol. I., Pts. 2 and 3.

Naturalists' Guide (Huddersfield). Parts 1-38.

Naturalists' Record. Set.

Newbury District Field Club Transactions. Vols. III. and on.

North Staffordshire Field Club Reports for 1869, 1871-2, 1876.

Peterborough Natural History Society. Reports 1-3, 11-12, 14-25.

Quarterly Journal of Science. 1878-9, 1882-3, and 1885.

Quekett Club Journ. 1st Series, No. 25.

Royal Cornwall Geological Society Trans. Vol. V. to date (or parts).

Salisbury Field Club. Transactions, Vol. II.

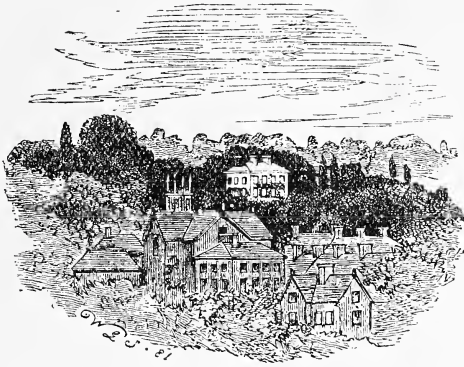
Scottish Naturalist. 1881-1891.

Apply—Editor, The Museum, Hull.

NOTES AND COMMENTS.

DARWIN'S BIRTHPLACE.

'Mount House, Frankwell, Shrewsbury, Charles Darwin's birthplace, has been bought by His Majesty's Office of Works, for the accommodation of a body of clerks. The purchase includes the famous Darwin Walk. The illustration gives a view of the Mount, as seen from the Castle, which was sketched by Mr. Worthington G. Smith in 1881, to whom the house was pointed out as one of the sights of Shrewsbury.' The above note appears in *The Gardener's Chronicle*, No. 1815, to



the editor of which we are indebted for permission to reproduce the block to which reference is made.

THE WORLD'S SCIENTIFIC PERIODICALS.

The Conjoint Board of Scientific Societies, Burlington House, London, has arranged, if sufficient support is obtained, for the issue of a world list of periodical publications which contain the results of original scientific research. The list will be an octavo volume containing, in alphabetical order, the titles and places of publication of all such periodicals in existence on January 1st, 1900, and of all issued after that date. The copies will be printed on one side only to facilitate alterations and additions. The objects of the proposed volumes are: (1) to supply as nearly as possible a complete list of current scientific periodicals; (2) to indicate, where possible, at least one Library where each periodical is taken; (3) to form a basis for co-operation between Libraries, so that both the number of duplicates and the list of periodicals not taken in may be reduced; and (4) to enable each Library to use the list for its own purposes, by placing a mark against the title of each periodical it possesses, by cutting up for a card index, etc. The volume will be not more than £2 2s. net, and subscriptions should be sent to Prof. W. W. Watts, the Hon. Secretary.

NATURALISTS AND CAMERAS IN WAR TIME.

In Professor Oliver's Report on Blakeney Point, appearing in the *Transactions of the Norfolk and Norwich Naturalists' Society* recently received, we notice the following:—'The use of cameras on the Point was, of course, strictly forbidden, and the instruments if discovered were liable to confiscation. People who wanted to take photographs, however, soon found a way of circumventing this regulation. The Guard, in their exile from civilisation, were always in a chronic state of hunger for papers and magazines, and have been known to break into unoccupied huts in search for fresh reading matter. It was found that by dumping an armful of "John Bulls," "Strands," etc., in the Guard Room, several hours could be secured free from all risk of disturbance, during which plates and films could be exposed with perfect impunity.'

BRITISH MYCOLOGISTS.

Among the contents of the *Transactions of the British Mycological Society* for 1920, recently issued, we notice 'Studies in Entomogenous Fungi' by T. Petch; 'The Imperial Bureau of Mycology,' by E. J. Butler; 'An Investigation of some Tomato Diseases,' by F. T. Brooks and G. O. Searle; and 'Homothallism and the Production of Fruit-Bodies by Monosporous Mycelia in the Genus *Coprinus*,' by Miss I. Mounce. Mr. Petch's contribution is illustrated by some of the most beautiful coloured plates we have seen for some time. In the same publication, Mr. R. L. Collett records a case of the persistence of life in the spores or mycelium of a Hyphomycete kept as a museum specimen for sixty-seven years.

LINNEAN HERBARIUM.

At a recent meeting of the Linnean Society, the General Secretary, Dr. B. D. Jackson, gave an account of the recently-completed Catalogue of the Linnean Herbarium. He stated that his first reference to the Herbarium was made nearly 50 years ago, when he found that Mr. A. Kippist, at that time Librarian, could not explain certain signs employed by Linnaeus, the meaning of which had been lost. The speaker's first published contribution to a knowledge of the herbarium was made in 1888, when he was commissioned by the President, Mr. W. Carruthers, to draw up an account of the growth of the collections, their purchase by Dr. J. E. Smith, and lastly, their acquisition and tenure by the Society. In turn followed an account of the Banksian desiderata supplied from the Linnean stores; the List of the genera with the number of sheets in each, and the Index issued in 1913. A diversion to the zoological collection came to publication in the next year; then Tulbagh's considerable collection in 1918, and finally the present MS., which has taken more than two years

to compile. The guiding idea has been to supply the answer to future enquiries such as "Who wrote that?" by giving the writer's name to each label or comment, wherever possible, the Linnean letters affording an invaluable help in identifying handwriting. The MS. has been drawn up for reference in later years; it includes the interpretation of many signs used by Linnæus, the meaning of which had been lost for more than a century, but was now rediscovered.

REPAIRS TO BRONZE-AGE VESSEL.

In *The Naturalist* for May, 1904, we figured an interesting



Bronze-age handled vessel, of earthenware, found near Grantham. By the courtesy of the Editor of *The Connoisseur*, we are now able to give an illustration of a somewhat similar cup, recently found near the same place. It is $6\frac{3}{4}$ inches high and $4\frac{3}{8}$ inches in diameter. An interesting feature is indicated as 'the furnaceman had had an accident and broken out a large portion of one side when placing it in the kiln . . . the man has carefully kneaded up again the damaged piece of clay, and has remodelled that portion of the cup with great care and success. But when he attempted to put on the lost ornament, his skill failed him, and perforce he impressed the clay with a few crude marks and indentations, probably with his finger tips.'

PALÆONTOLOGY.

The Palæontographical Society is still suffering from the effects of the war, and its volume LXXIII., recently to hand, is smaller than usual. But it is well worth the small subscription of one guinea, and we hope the appeal of the Hon. Secretary (Dr. A. Smith Woodward) for further members will meet with the response it deserves. The volume contains three important and well illustrated monographs, viz: (1) 'The Pliocene Mollusca,' by F. W. Harmer; (2) 'Ordovician and Silurian Bellerophontacea,' by F. R. Cowper Reed; and (3) 'Carboniferous Insects,' by Herbert Bolton. In each monograph many north country species are figured and described.

POLLINATION OF PRIMULAS.

At a recent meeting of the Linnean Society of London, Mr. Miller Christy read a paper on 'The Problem of the Pollination of our British Primulas.' He dealt with our three well-known species (*Primula vulgaris*, *P. veris*, and *P. elatior*), all extremely abundant in Britain, though the last-named locally only. The question as to the insect or insects which pollinate these flowers was first raised by Darwin, just sixty years ago, in a series of papers read before the Linnean Society. That question is still unanswered, in spite of much subsequent field-observation and discussion. Mr. Christy enumerated his own numerous observations, extending over forty years, in the form of three tables, and further cited all known observations recorded by others. He discussed also the relation necessarily existing between the depths of the corolla-tubes of the flowers and the length of the tongues of insects known to visit the flowers.

NIGHT-FLYING MOTHS.

The observations showed that about thirty species of insect had been seen to visit or frequent the flowers of the three Primulas. A small proportion of these (namely Hymenoptera, Diptera, and Lepidoptera) had long tongues, and were certainly able to effect pollination in the regular manner. Their visits to the flowers were, however, so comparatively rare that it was impossible to suppose they effected pollination to an extent adequate for the perpetuation of any of the three species of *Primula*. Most other insect visitors were short-tongued bees, totally unable to effect pollination at all; and, as these visited the flowers only to steal their pollen, their visits were actually detrimental, rather than beneficial, to the plants. Yet other insects, chiefly Coleoptera, frequented, rather than visited, the flowers in considerable abundance; and these seem quite capable of pollinating them, though in an irregular manner, which one cannot suppose to have been intended. Thus far, therefore, the problem remained unsolved, and it was necessary to search for some other agency for the normal and regular

pollination of the flowers. This agency was to be found in night-flying moths—a surmise advanced by Darwin at the very outset of the controversy, but not carried further by him.

THE PRESS AND GEOLOGY.

The daily paper is occasionally entertaining. In describing the 'remarkable developments' of a company in excavating the well-known section in the Millepore Limestone near South Cave railway station, E. Yorks., it is stated 'the presence of stone in this locality, where chalk is so prevalent, was originally discredited, and archæologists have pronounced this discovery of stone in the vicinity of numerous chalk quarries as highly remarkable.'

A VANISHING HILL.

Similarly, *The Leeds Mercury* records a conversation with a Goole sea-captain respecting a hill which is 'slowly settling down and gradually running away into the river,' due to 'strong currents in the river which have worn away the land.' We learn that 'Somewhere about midway between Goole and Hull, clearly to be observed from the Blacktoft jetty, but on the opposite side of the river, is a hill which, years ago, completely hid the church and the houses of the village of Alkborough from the eye of the passing vessels. Only the top of the church spire was to be seen. In the course of time the hill seems to have grown smaller, because at the present day not only is the spire visible, but the church and the village as well, and yet, apparently, the church is as far from the river shore as it was in former days when only the spire could be seen over the hill-top.' All this has occurred during the past thirty years. Possibly the fact that during that period the ships have increased in size, and consequently the captain has been able to see further over the hill than formerly, explains this 'miracle'!

THE EDINBURGH REPORT.

Within twenty days of the same year as the meeting in which the British Association was held, its Report appeared, bound in respectable cloth for those who sent the necessary extra two shillings. Compared with pre-war days, it is still on the 'thin' side; yet in its 560 pages, is a good survey of the various efforts to advance science, made at Edinburgh. Besides the numerous Presidential Addresses, there are several valuable reports of Committees of Research, dealing with Seismology, Tides, Credit, Currency and Finance; Engineering Materials; Pictures for Schools, etc. There are brief summaries of the papers read at the sections [these we should like to see extended] and the Report of the Corresponding Societies' Committee. This includes Sir Richard Gregory's address on 'The Message of Science,' and a 'List

of Papers bearing upon the Zoology, Botany and Prehistoric Archæology of the British Isles, issued during 1920,' by T. Sheppard. This list contains reference to about three thousand papers and notes.

THE BRITISH ASSOCIATION.

In connexion with the Hull Meeting of the British Association, it is hoped that Yorkshire Naturalists will assist in supporting the people of Hull in making this visit to the county by the Association a thorough success. No technical qualification is required on the part of an applicant for admission as a Member. All Members (except as specified below) are eligible to any office in the Association. (I.) Life Members for a composition of £15, which entitles them to attend the Annual Meetings and to receive, if they desire, the Reports of the Association that may be published after the date of their admission. (II.) Annual Members—(a) on a payment of £1 10s., made before or at the Annual Meeting, are entitled to attend the Annual Meeting, and to receive the Report; (b) on a payment of £1, are entitled *either* to attend the Annual Meeting or to receive the Report. (III.) Transferable Tickets, price £1 5s., admit one person to any meeting or other function during the Annual Meeting, but to no other privilege. (IV.) Students' Tickets, price 10s., may be obtained—(a) by University and other students and by teachers, vouched for by the Local Executive as resident or working in the locality where the Annual Meeting takes place; (b) by University Students not resident or working in the locality where the Annual Meeting takes place, on the recommendation of any recognised University or College. Such students may obtain these tickets on one occasion only, provided that by doing so they shall not be disqualified under clause (a) above. Students' tickets do not admit holders to any office in the Association, or entitle them to receive the Report. Application forms can be obtained from the local Secretary, at the Museum, Hull, and Cheques and money orders be made payable to the City Treasurer, Hull. (T. G. Milner, Esq.).

—: o :—

La Distribution Géographique des Animaux, par le Dr E. L. Trouessart. 350 pp., 10 fr. Cartonné toile, 12 fr. The book forms part of the 'Encyclopédie Scientifique,' and describes the present-day distribution of animal life on the surface of the globe. The work deals, in a comprehensive manner, with the connexion between distribution of fauna and geological formation, and the changes consequent upon the variations in the earth's crust. The chapter on the 'Migration of Birds' is worthy of note, and also those dealing with 'Bi-polar Fauna' and 'Sea and Freshwater Fauna.' The book achieves its object in connecting in one work the various sections which are usually the subject of specialised study.

MIGRATION OF THE COMMON SWALLOW

*(HIRUNDO RUSTICA L.).**

H. B. BOOTH, F.Z.S., M.B.O.U.

IN the first place, may I sincerely thank the members of the Yorkshire Naturalists' Union for the very great honour they have conferred upon me in electing me their President. There is one sad event that has always hung its shadow over me as your President for this year. I refer to the death of our highly esteemed and deeply lamented friend and member, the late Dr. H. H. Corbett. I believe it is the first occasion upon which an elected President of the Yorkshire Naturalists' Union did not survive to give his presidential address.

The Common Swallow, also known as the Chimney Swallow, because of its former habit of building its nest in the old-fashioned open chimneys. It is also known in some parts of the country, as well as in Sweden, as the Barn Swallow, a very appropriate name, as it is very fond of making its nest on a beam or rafter in a barn.

For the purpose of this paper, I shall ask you to consider the Swallow as a bird nesting in Europe, and spending the period of our winter in Africa. This is not strictly accurate, as our Swallow also nests in north-west Africa and in south-western Asia, these latter birds spending the winter period in India, its islands, and in Ceylon. I must not use the words so frequently used, viz. : *winters in*, because the Swallow, and other long-distance summer migratory birds know not any winter; they are birds of perpetual summer. As soon as our European summer is waning, and the domestic duties of the birds finish, they flit away thousands of miles to the summer that then is just commencing in the southern hemisphere. In Western Asia, *H. rustica* is irretrievably mixed up with the eastern race (*H. gutturalis*), and other geographical races extend almost over the whole habitable parts of the globe, with the exception of New Zealand. In Egypt there is a closely allied resident and non-migratory race : *Hirundo savignii*.

The Swallows usually arrive in Yorkshire during the second half of April and early in May. Although everyone is delighted to see the first Swallow, and to think of brighter days in store, yet the first Swallow is usually an erratic and uncertain straggler, and it is not safe to base any scientific or other calculation upon the time of his arrival, and the proverb that 'A single Swallow does not make a summer' is a very true one. I have noticed that whether Swallows arrive earlier or later, more depends on the weather in the south of Europe than upon the weather here. Say, for instance, there is a prolonged spell of bad weather in France, Spain and Portugal, the birds are held up, and have to spend most of their time in finding sufficient

* Presidential Address to the Yorkshire Naturalists' Union, delivered at Hull, December 3rd, 1921.

food in order to keep alive, without journeying further north into the bad weather. On the other hand, when conditions are fine and suitable in Europe to the south of us, immigratory birds will sometimes suddenly plunge into the most vile weather here. Who has not been moved to pity on seeing crowds of starved Swallows and other immigratory birds, all looking abjectly miserable, in heavy and continued showers of sleet, just after their arrival? In normal seasons and shortly after the breeding Swallows have arrived and settled down early in May, very little time is lost in starting nesting operations. Usually a new nest is built close to, or actually upon the site of that of the previous year; or at times the old nest is repaired.

There is a belief that Swallows, etc., being called 'summer visitors,' are foreign birds, and come to spend a summer holiday and honeymoon here. This is not so. They are thoroughly all-British; they first saw the light of day here, and gladly return many thousands of miles to make their home here again at the first opportunity. In fact it is doubtful if they would leave at all if their food supply were assured throughout the winter. Their food consists of insects taken on the wing. It is quite true that they often leave, and particularly the young birds of the first brood, when there is a plentiful supply of food. But that is a call of Nature to wise swallows to be ready and not to stay until the food has failed and they cannot find sufficient of it to give them strength to make their great journey. Every mild autumn and winter, laggard swallows are reported for almost every one of the colder months, and here and there, in a favourable spot, one manages to exist throughout the winter. Even so far north as in Yorkshire one of a pair managed to survive in a cowhouse at Masham, during the exceptionally mild winter of 1895/6.

For a long time it has been known that Swallows, particularly the mature birds, usually return to the actual spot which they left the year before. Many birds have been marked in the past in various ways, though markings on their feathers are valueless, as they undergo a complete moult in their so-called winter quarters. Recently a more accurate system of marking has been practised, viz., by means of numbered and addressed aluminium rings being fixed on the legs. The results, particularly with the species under notice, have been remarkable.

In 'Results of a Study of Bird Migration by the Marking Method,' at the Aberdeen University, Dr. A. Landsborough Thomson says of the Swallow,* 'There are three records of birds of this typically migratory species returning to the localities of marking in the following seasons. Two were marked as nestlings and one as an adult, the details being as follows:—

CASE 15: Caught, marked and released as an adult bird at a farm in Kent on 29th June, 1909; recaptured at the same farm on 14th June, 1910.

* *The Ibis*, 1921, p. 511.

CASE 201: Marked as a nestling in Kincardineshire on 21st August, 1910; found with a broken wing in the same village on 22nd May, 1911.

CASE 483: Marked as a nestling at Beaulieu, Hants., on 6th September, 1912; caught in an outhouse, where it was believed to be nesting, at Ringwood, Hants., about eighteen miles from its birthplace, on 2nd May, 1913.

It is noteworthy that the last-named bird, although it was only marked as a nestling in a later brood on September 6th, yet it had already returned, and was believed to be nesting as early as May 2nd of the following year.

Mr. H. F. Witherby, in the *British Birds* marking scheme, has had some very remarkable results with 'ringed' Swallows.* Under the heading 'Ringed as Nestlings and recovered at home,' he says, 'Twelve ringed in Yorkshire, Lancashire, Staffordshire, Warwickshire and Surrey, have been recovered at the same place in the summer of the following year, and one ringed in Lancashire, two years afterwards.' The Yorkshire bird referred to was marked by Mr. F. W. Sherwood at Ingleton, on June 20th, 1915, and reported by Mr. M. Ramwell at the same place on May 29th, 1916.† A nestling marked at Broughton, in Peeblesshire, on July 4th, 1914, was reported at the same place nearly two years after—on May 5th, 1916. Another nestling, ringed near Glasgow, on June 29th, 1914, was reported by Mr. D. Green at Skipton, Yorkshire, on May 23rd, 1915.‡ Two others, marked in Hampshire, were found the following season, one in Middlesex and the other in Sussex. It is possible that these young birds were diverted from returning to the homes of their birth by pairing with mates (probably their seniors) belonging to other districts.

Dealing with Swallows 'Ringed as adults and recovered at home,' Mr. Witherby continues, 'Three ringed in Staffordshire and Lancashire have been recovered at the same place in the following summer, and two ringed in Dumfriesshire and Peeblesshire in summer two years afterwards.'

One of the Staffordshire birds was a very interesting case. It was caught by Mr. J. R. B. Masefield at Cheadle, on May 27th, 1912, as an adult female on the nest, and ringed. It was caught again on the same nest on June 10th, 1913.§ I believe that I am correct in saying that no adult Swallow ringed here has ever been retaken in its summer quarters, excepting at the same place where it was ringed; so I trust I have proved that the great majority of Swallows do return to the spot which they left to commence their long journey south. Probably almost all would do so, excepting for the all important question of mating; for it is very obvious that when two birds, each belonging to a different district, pair together, they cannot both return to their respective districts.

* *British Birds*, Vol. XIII., p. 294. † *British Birds*, Vol. X., p. 62.

‡ *British Birds*, Vol. IX., p. 268. § *British Birds*, Vol. VII., p. 163.

Now let us assume that our local breeding Swallows have arrived and settled down—there may still be variation in the numbers present for two or three weeks, but this is caused by the coming and going of passing birds that have broken their journey for food or rest on their way to further northern breeding grounds. During the first or second week in May, according to circumstances, nest building will be commenced. From observations made, both in Norfolk and in Yorkshire, I have found that from the commencement of the first nest, until the fledged young are able to leave that same nest, takes quite seven weeks. By using this same calculation now, we may assume that nestlings of the earlier first broods would be on the wing by the end of June, or very early in July, and well able to look after themselves by the middle of July, when their parents would lose little time in commencing with the second nest. From now onwards, these youngsters, being left to their own devices, and without any household cares, would have much in common and would keep more together, than with the older birds, who would now be more concerned about their second brood.

It is these young birds of the first broods, after flying about feeding for a few weeks, gaining strength of wing and power of endurance, that perform one of the many wonderful feats of bird migration. Unaided and without any leadership and while food is still very plentiful, they will embark on a journey of several thousand miles, over lands, seas, mountains and plains which they have never seen, and in varied climes where they have never been. Towards the end of August, assemblies of these young Swallows are much more noticeable towards the evening as they cluster about some building, telegraph wires, or other similar position, all being very restless and excitable. Darkness comes on, and they are still there, and still restless; but in the morning every bird has gone. In these early gatherings I have never detected any adult birds, and they are quite easy to tell; but very often they are accompanied by young House Martins. Batch after batch leaves until well into September, when the young of the second brood are able to undertake the journey, and young and old birds then leave and travel together. It is often stated that there must be leadership by birds that have made the journey previously. If so, what about the young Cuckoo, left as a helpless, unfledged nestling in the care of foster parents, which as a rule, do not leave this country. Yet, two months or so later, and as soon as the bird gets strong enough, it wings its way to the land that its parents are already in, probably south of the Equator. If young Cuckoos can manage alone and unguided, why not young Swallows? In the latter half of September vast numbers of Swallows (old and young together), congregate in various parts; but particularly along the south coast of England. Doubtless they are made up of contingents from different

districts, and often augmented by birds that have bred further to the north; and have accidentally met on passage. By the middle of October, emigration here is practically over, with this species, excepting for stray birds.

Much has been written about flight-lines, and many largely imaginary lines have been drawn. With these I don't intend to deal, as I don't consider them to be essentially applicable to the species under notice. In fact, there is a good deal of evidence accumulating which tends to prove that some birds do not return by the same route by which they departed. The 'ringed' systems have not so far thrown much light on the routes taken by British emigrant Swallows. A nestling marked at Southport on August 31st, 1917 had reached the Isle of Wight by October 23rd.* Another bird ringed near Lancaster, on June 29th, 1910, was recovered at Villedon, Indré et Loire, near the centre of France.† It is evident that this bird was not travelling the 'coast route.' A nestling ringed in Staffordshire was reported as found dead in Brittany in the following December, but it is uncertain how long the bird had been dead, and another nestling ringed in Staffordshire was reported from the south-west of France (Charente-Inferieure), in the following October. Another bird, ringed in Staffordshire as a nestling, was found dead after a snowstorm near Bilbao, North Spain, in March, and nearly two years after ringing.‡

It is with Swallows ringed here, and taken in their southern homes south of the Equator, however, that Mr. Witherby's bird-marking scheme has met with such wonderful success. No fewer than five birds marked in Great Britain have been recovered in South Africa.

The first of these was an adult Swallow (believed to be the female, as both birds of the pair were marked), which nested in a porch at Cheadle, in Staffordshire, and was marked by Mr. J. R. B. Masefield, on May 6th, 1911. It was caught in a farmhouse, near Utrecht, Natal, on December 23rd, 1912, and the ring taken off its leg.§

Another Swallow, a nestling, ringed by Mr. R. O. Blyth, at Skelmorlie, Ayrshire, on July 27th, 1912, was captured at Riet Vallei, District Hundley, Orange Free State, on March 16th, 1913, and the ring returned to Mr. Witherby.|| A third bird ringed as a nestling by Mr. F. W. Sherwood, at Lytham, Lancashire, on July 3rd, 1915, was picked up dead near Grahamstown, Cape Province, South Africa on February 6th, 1916, and the ring taken off and returned.** The fourth bird was ringed as a nestling by Mr. H. W. Robinson, at Low Bentham in the West Riding, on August 10th, 1918. The Bishop of Glasgow, who was out on a visit, saw the ring and reported to Mr. Witherby that the bird was picked up about the 21st of

* *British Birds*, Vol. XII., p. 155. † *British Birds.*, Vol. IV., p. 179.

‡ *British Birds*, Vol. XIII., p. 294. § *British Birds*, Vol. VI., p. 277.

|| *British Birds*, Vol. VII., p. 167. ** *British Birds*, Vol. IX., p. 298.

February, 1919, in Michael Givensa's cattle kraal in East Griqualand, South Africa. The Swallow was very thin and exhausted. The natives all thought it boded ill-luck for Michael and considered that it was a clear case of witchcraft for a bird to appear from 'nowhere' with a ring round its leg, and alight in a cattle kraal!* The fifth case was ringed as a young bird by Mr. J. Bartholomew, at Torrance, Stirlingshire, on June 27th, 1919, and was caught, the ring taken off and the bird released near Lake Chrissie in the Transvaal, on January 28th, 1920, and the ring returned.† It is a remarkable fact that these five birds, the homes of which are almost in the extreme north-west of Europe, should all be recovered on the eastern side of South Africa. It should not be overlooked that these places are in our colonies, where English is well known, and where the bird-ringing schemes have been largely advertised.

I will now select a few field observations on their southern movements, when the migratory Swallows are well on their way south. One of the most interesting is told by Commander H. Lynes, R.N., in *British Birds*, Vol. I. pp. 285-7. He was collecting African birds on the undulating hills about seven miles inland from Mombasa, in British East Africa, on November 1st, 1907. About noon there flitted past him two or three birds that looked very much like English Swallows. 'About 12-30 p.m., I became aware of an intermittent passage to the south-south-west of some parties of the same—five or six at a time. They were flying low, never more than twenty feet from the ground, and often just skimming over the tops of the long grass and bushes, but always pressing onwards in a steady businesslike way, at the rate of about twenty-five mile an hour. Up to 2-30 p.m., it had been a fine day, when dark clouds gathered, and the wind changed and rose, and there was every indication of a rapidly approaching rain-storm. The effect of the probable storm on the Swallows was wonderful. They would not face it and proceed. A banking up of the migratory stream resulted, and the air was simply alive with Swallows from the ground level up to 1000 feet high, all evidently catching what flies they could, so as to make the best use of their delayed time. There must have been thousands in my field of vision.' The threatened storm did not come, and Comm. Lynes started on the chase after some African birds that he had never seen before. When he returned in about a quarter of an hour, the Swallows had almost disappeared, 'leaving hardly a single bird in view, and in another five minutes not one European Swallow could be seen.'

(*To be continued*).

* *British Birds*, Vol. XIII., p. 196. † *British Birds*, Vol. XIV., p. 42.

SECTIONS IN COAL-SEAMS AT TRUNCLIFFE GATE, ODSAL, NEAR BRADFORD.

J. A. BUTTERFIELD, M.SC., F.G.S.

EXCAVATIONS are being carried out by the Bradford Corporation in a scheme for the widening of the Huddersfield Road, and they bring out certain interesting details. Mr. Jenkinson, the engineer in charge, permitted me to obtain the following details in October last.

Truncliffe Gate is on the Huddersfield Road, about 2 miles south of the centre of Bradford, and at a height of about 700 feet, just below the water-divide of the Aire and Calder valleys. The top of the ridge is composed of Oakenshaw Rock, one of the principal sandstones of the Lower Coal Measures in this district, and the excavations are made in the shale lying at the base of this Rock. Towards the base of the Oakenshaw Rock, and towards the top of the underlying shale, the Geological Survey mark two workable coal seams—the Carr House Coal and the Black Bed Coal respectively (see sheet 216, 6 in. Geol. Map)—and in other parts of the district they mark three minor seams, but these are not mapped as present in the area under consideration. The beds in this district are practically horizontal over a fairly wide area.

The position and nature of the excavations can be seen from Fig. 1. They lie between the Fox and Hounds Hotel and the Truncliffe Hotel, and present three indentations into the side of the road. They have disclosed a seam of cannel coal about 8 ins. thick when it is normally developed, and of fairly good quality. The coal is well jointed and runs horizontally. It overlies green sandy shale, the bottom of which is not exposed, and is overlain by dark grey shale. Both these shales are very well bedded, and in their normal development give horizontal bedding. The proximate analysis of the cannel coal is as follows :—

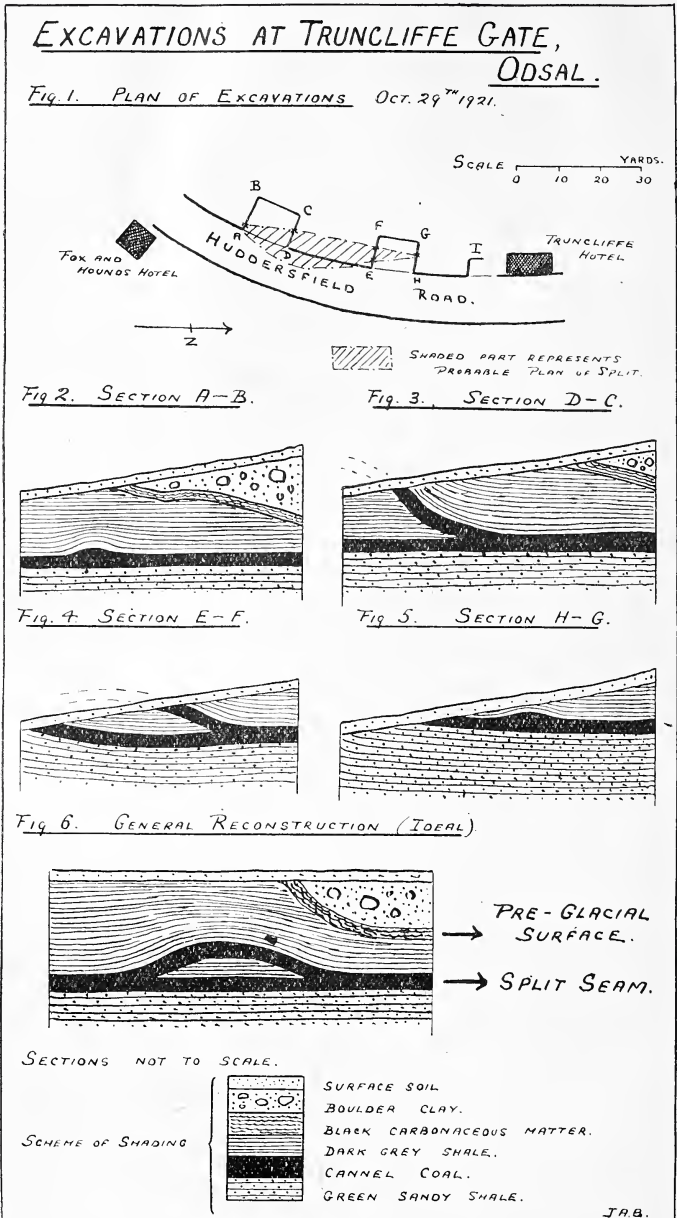
Moisture	...	...	3.24%
Volatile Matter	...	...	31.21%
Fixed Carbon	...	...	42.10%
Ash	...	...	23.44%

99.99

The coal is evidently one of the minor seams marked in other parts of the district, but not mapped here.

The main point, however, is that there is here one of the finest examples of a split coal seam that could be desired, and the four sections shown, Figs. 2, 3, 4, and 5 indicate the nature of this abnormality. The coal seam as exposed in the faces parallel to the road is about 8 ins. thick, but on being traced towards the road it decreases in thickness to about 6 ins.,

and then splits into two as shown in Fig. 3. The bottom



component of the split continues horizontally, and is about $4\frac{1}{2}$ ins. thick, but the top component, of thickness about 4

ins., runs up in a convex manner, as shown in sketch. The material inside the lens of the split is grey shale similar to that above the coal seam, but whereas the bedding in the lens is horizontal, that above the split follows the convex form of the upper component. Fig. 4 gives a second section in the middle excavation, and this shows a little more of the split. The three excavations are at successively lower levels, the one marked I being lowest. Figs. 2 and 3 give sections across the ends of the split, where there is merely a hunching up of the seam with a consequent upfolding of the bedding of the shale. These four sections taken together evidently mark out the extent of the split. Figs. 2 and 5 give the ends, and Figs. 3 and 4 give sections across the middle. An attempt is made in Fig. 1 to mark out the extent of this split, and from it it will be seen that it is roughly elliptical, about 40 yards long and over 10 yards broad. A general reconstruction of the split is given in Fig. 6, as it would appear in a section across the middle of the complete split.

Such split seams are not by any means new. They are known in most of the coalfields, and have given trouble. Prof. P. F. Kendall has worked out some of the splits in the Yorkshire coalfield in detail, and for a description of one of the larger ones—the Whitwood Split—reference should be made to his paper 'On the Splitting of Coal Seams by Partings of Dirt, Pt. 1, Splits that Rejoin,' *Trans Inst. Mining Engineers*, Vol. LIV., Pt. 5, pp. 460-479. He offers an explanation somewhat as follows. Imagine a layer of peat forming, and after some time traversed by a stream. This stream will cut out a channel which will eventually be filled by sand or mud. The river may cease to run, and the peat formation will continue over the top of the whole. Thus will occur two layers of peat inseparable in its normal development, but separated at one place by a parting of dirt, plano-convex in form, with the plane surface uppermost. The whole becomes covered by great thicknesses of sediment, and the peat becomes compressed. But the peat and sediment are not compressible to the same extent. Prof. Kendall considers that the peat may be compressed into $\frac{1}{20}$ th of its bulk on turning into coal, whereas the sediment loses very little in size during the compression. The result after compression is a coal seam parted where the channel was by a parting of sediment, plano-convex in shape, but with the convexity upwards. This reversal of the lens is well displayed in this case at Truncliffe Gate. The only difficulty appears to be in the fact that owing to the very small size of this split, and the fact that it is elliptical in form, it could not possibly have been caused by a stream cutting out a channel in the peaty substance suggested. It is more probable that there has been some depression in the peaty substance being infilled with sediment before the formation of further peaty material on the top. The fact that the normal

seam is reduced in thickness as it nears the split seems to suggest a sagging or pulling out motion. The word 'peaty' is used in this paragraph to denote the matrix of the cannel coal before consolidation, and it is not implied that the cannel coal grew on the spot in the form of peat.

A further point of interest at the southern end of the exposure is a carbonaceous layer, starting some feet above the coal, cutting across the bedding of the grey shale, and descending on to the coal, eventually cutting the latter out altogether. This layer is about 3 ins. thick, and above it is boulder clay. On closer investigation this carbonaceous layer consists of powdered coal, shale and clay mixed. It probably marks out a pre-glacial land surface, and is itself the smeared-out remains of the coal taken from the part of the seam where the boulder clay descends on to the green sandy shale. Further excavation might yield decisive evidence.

In the widening of the road, this split which is an exposure lying at the surface, will be entirely dug out, and no evidence will be left. The members of the Geological Section of the Bradford Scientific Association are, however, watching it with great interest, and are keeping records.

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We are glad to find that the members of the British Association can now have their Annual Reports bound in cloth, if applied for, on payment of 2/-.

The Royal Society has awarded its Royal Medal to Dr. F. F. Blackman for his researches on the gaseous exchange in plants and on the operation of limiting factors.

Messrs. Wheldon & Wesley, of 38 Great Queen Street, W.C.2., have issued Part 2 of their excellent Botanical Catalogue, which contains something like 650 entries.

British *Limnobiidae*: 'Some Records and Corrections,' by F. W. Edwards, appears in *The Transactions of the Entomological Society of London*, recently issued.

A park, museum and art gallery at Accrington, the gift of the late Annie Haworth and of the late William H. Haworth, costing £50,000, were recently opened by the mayor.

Mr. W. Whitaker's seventeenth Presidential Address, this time to the Geologists' Association, is entitled 'Geologists and the Geologists' Association,' and appears in the Association's Proceedings recently issued.

The Proceedings of the Society of Antiquaries of Newcastle-upon-Tyne just published, contains particulars of a bronze-age Cist recently found on the Hexham Golf Course, and a paper on Warden Hill Camp and 'The Castles' in Weardale.

At a recent meeting of the Geological Society of London, Prof. E. J. Garwood exhibited the earliest recorded [? freshwater] Gasteropod (*Viviparus* [*Paludina*]) from the local base of the Carboniferous rocks, near Horton-in-Ribblesdale (Yorkshire).

Volume XXI. of the *Transactions of the Cumberland, etc., Archaeological Society* contains 'Explorations in the Roman Fort at Ambleside,' by R. G. Collingwood; 'Cumberland Ports and Shipping in the Reign of Elizabeth,' by P. H. Fox; 'Fountains Abbey and Cumberland,' by W. P. Haskett-Smith; 'A Roman Well at Carlisle,' by H. Redfern; and numerous other contributions.

RECENT GLACIAL SECTIONS IN HOLDERNESS.

T. SHEPPARD, M.Sc., F.G.S.

WITH Mr. J. W. Stather, I recently visited a few sections in the Glacial Series between Hull and Hornsea.

At Skirlaugh, opposite the church, the road has recently been widened in view of the increased motor and other traffic, and has exposed a section in boulder clay varying from three to seven feet in height, which, as yet, is not grassed over. The clay is unusually full of pebbles, in this respect contrasting with the upper part of the coast sections, where the clay contains very few; but this particularly strong feature at Skirlaugh is doubtless due to the inclusion in the clay of pebbles derived from the gravels which are so frequent to the North and East. Some of the contained pebbles, such as Mica Schist and Cheviot porphyrite, were very rotten, and could be crushed to powder in the hand. The usual preponderance of small pebbles of Cheviot porphyrite and Grauwacke (from the same area as the porphyrite) indicates that clay exposed is of the Upper or Hessele Boulder clay type. Large boulders, up to a foot or more in diameter, of basalt, Carboniferous limestone, and an occasional granite, taken from the clay, are used in curbing.

As a result of the necessity for obtaining gravel locally for the purpose of making concrete for house-building, etc., many gravel pits, which had been almost or entirely neglected before and during the war, have recently been opened out. The well-known hill near Brandesburton, known as Coney Garth, is near to that which years ago yielded remains of mammoth, etc., to Clement Reid (see 'Geology of Holderness,' 1885,) has been purchased by the Beverley Corporation, and is being carted away. Thus, by artificial means, the Holderness landscape is changing; the one time feature known as Kelsey Hill being now a deep hole, due to the necessities of the North Eastern and the Hull & Barnsley Railway Companies.

The section exposed at Coney Garth is quite typical of the Holderness glacial beds, and shows current-bedded sands and gravels, usually well rounded, with occasional shell fragments, and the typical assemblage of rocks from the Lake Districts, the Cheviots, Scotland, Scandinavia, the bed of the North Sea, and the East Coast. Mammalian remains do not appear to have been recorded recently, excepting the 'skeleton of a monk,' which the men inform me was obtained some little time ago, though this gentleman, of course, was much later in date than the gravel beds.

At Leven, near the road-side, an old pit has been re-opened, and has exposed a section eight or ten feet in height, very much resembling the section near Cottingham referred to in the Annual Report of the Yorkshire Naturalists' Union (see

The Naturalist, Jan., p. 46). At Leven, however, while the bedding, as at Cottingham, is fairly constant in one direction, and at an angle of about 40 degrees, the contained pebbles are practically the same as those in the Kelsey Hill and other Holderness Glacial Mounds. There is no covering of Boulder-clay, and from the small size of the material, and the fact that such shell fragments as obtained were reduced in size to almost unrecognisable pieces, and were few and far between, the impression is given that the great flat mass of gravel at Leven, in which this section occurs, is derived from gravel hills which once existed a little to the North-east. The gravel reaches practically up to the soil, and in one or two places were ferruginous masses hardly definite enough to be called 'pipes,' among which some of the larger pebbles had stalagmitic deposits upon them due to the disintegration of the fragments of limestone, in many cases small pebbles of various kinds were cemented to the larger ones by means of this calcarious deposit.

This pit yielded the usual glacial erratics, notably Rhomb-porphry (from Christiania), Cheviot porphyrite, and the fossils *Gryphoea incurva*, from the Lias, and *Belemnites lanceolatus* from the chalk, probably in the North Sea Bed.

As already reported, the shells were very small and smashed to pieces, but among these, respecting which there can be little doubt as regards identification, were *Tellina* sp.?, *Cyprina islandica*, *Cardium edule* and *Buccinum undatum*. There was also part of a *Balanus*.

At Catwick, an old and extensive gravel pit has recently been re-opened, and shows a wall very similar to that just described at Leven, excepting that there is a greater proportion of larger pebbles and boulders. This pit occurs on a slight rise at the side of a stream which evidently drains an ancient mere. Shell fragments here were apparently entirely absent, although a more prolonged search might have revealed a few small pieces. The 'pipes,' due to percolating water, were much more definite, one in particular being most marked as all the pebbles within the eight inches or so of its width were in a perpendicular position, whilst the long axis of those in the gravel on each side were almost horizontal.

In this quarry we picked up the same class of erratics and fossils as mentioned at Leven, with the addition of a rather good specimen of *Ammonites communis* from the Lias, and a fairly large and quite typical *Belemnite lateralis* from the Speeton clay.

As it is possible that some of these sections may eventually again be neglected and grassed over, these notes are put on record.

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No. 243' of *The Connoisseur* has a well illustrated account of various objects of 'Blue John' from the Castleton quarry, Derbyshire, in the possession of the Rt. Hon. Earl Howe.

MAN AND THE GLACIAL PERIOD.

PERCY F. KENDALL. M.S.C., F.G.S.

IN the January number of *Man*, Mr. H. J. E. Peake adds one more to the many attempts to synchronise the stages of culture of the Older and Newer Stone Ages with the phases of the Ice Age, and if, like all his predecessors, he has failed of complete success, it may, perhaps, be that the problem is one incapable of solution by any one man. The equipment of knowledge that would be required for a successful essay seems to consist of three parts—first, a thorough familiarity with British Glacial Geology, not merely in one or two districts, but over a very wide and varied range of country, especially in the east of England, from the North Downs to the Scottish Border; second, a first-hand knowledge of the occurrences and characteristics of relics of Palæolithic Man; and, third, a sound and particularly comprehensive knowledge of the distribution of the Pleistocene Mammalia, whether associated with implements of human manufacture or not.

It may safely be affirmed that such knowledge and experience is not possessed by any single British geologist or anthropologist to-day, and it is permissible to doubt whether any two of the essential qualifications exist in combination. It might even be thought that the vast range and magnitude of at least two of the three would forbid all hope of a solution of the problem, but happily the task, too great for one, may be accomplished by two or more in collaboration, and the proposal to hold a joint meeting of the Geological and Anthropological Sections of the British Association at Hull suggests one way out of the impasse. When we contemplate the magnitude and variety of the topics to be discussed, and the number and enthusiasm of the probable contributors to the discussions, and the great diversity of opinions that prevails, it might be apprehended that the debate would be as protracted and almost as animated as a recent political logomachy on the same parallel of latitude. Some limitation in the area brought under discussion will be helpful in reducing the subject to manageable proportions, and another proposition to the same end is that certain intending participants should be invited to put a succinct statement of their views into tabular form as wall-diagrams. This would manifestly be a convenient and time-saving expedient; the speakers' views would be put and kept clearly before the audience, and much oral exposition would be obviated.

Mr. Peake, who will preside over the Anthropological Section, gives us, in the journal mentioned above, very much such a table as we want, and it usefully illustrates the imperative need for a joint action. The column, for example, in which the sequence of English deposits is given 'After Marr and Kennard (revised),' mentions, apart from 'Cromer

Drifts,' only one boulder-clay, the 'Chalky Boulder Clay,' which is placed by the authors *above* the Hoxne deposits, whereas, in the opinion of most geologists, they very clearly overlie it, and the 'Cave-earths of North Wales,' which are correlated with Scotch Valley glaciers, or the 'Lower Turbarian' of James Geikie, are, in the judgment of all recent workers in Glacial Geology, covered and, so to speak, sealed by deposits laid down by the great Ice Sheet which occupied the whole area of the Irish sea at a period very long anterior to the stage when its dwindled remnants had shrunk back into the minor valleys of the Scottish Highlands coincidentally with the formation of the Neolithic (50 feet) raised beach.*

Other criticism of this column, and its relation to the others, might well be advanced, but the object of these comments is not to provoke controversy or to express a mere barren dissent from the views quoted by Mr. Peake, but rather to enforce his plea for a combined effort to place our conception of the relation of Man to the great climatic vicissitudes of Pleistocene and later times in a clearer and more satisfactory light.

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Dr. N. Annandale writes on 'Museums and Taxonomic Zoology' in *The Museums Journal* for January.

The Quarry for January contains an illustrated article on 'The Newcastle Grindstone Industry,' by J. Rickerby.

Mr. R. S. Bagnall records *Dendrothrips ornatus* Jabl., an addition to the British fauna, in *Ent. Monthly Mag.* for January.

No. 690 of *The Geological Magazine* contains a paper on 'Brachiopods from the Magnesian Limestone of Durham,' by Dr. C. T. Trechmann.

The Lancashire and Cheshire Naturalist, published December 19th, contains further lengthy contributions on Plant Galls, and Muscineæ, already noted in these pages. There is also a note on the possible Lancashire example of the Goldcrested Kinglet.

Dr. W. E. Collinge writes on 'The Barn Owl' in *The Journal of the Ministry of Agriculture* for January. According to a diagram, the Barn Owl's food consists of Mice and Rats, 68%; House sparrows, etc., 9%; Shrews, 9%; small birds, 4%; Injurious insects, 7%; the remainder being neutral insects.'

The Journal of Botany for January contains 'Notes on British Euphrasias,' by H. W. Pugsley; 'The Seedling Foliage of *Ulex Gallii*,' by T. A. Sprague; '*Carex* forms by H. S. Thompson; 'Noteworthy Fungi,' by W. B. Grove; and 'A New British Flowering Plant,' by R. W. Butcher (reprinted from *The Naturalist*), etc.

In *Nature* for December 15th, referring to what are described as ice-knives, a writer says: 'At Edale Cross, 1750 feet above sea-level, the undamaged knives pointed their edges due east magnetic or directly to the centre of Sheffield. The intervening distance is more than sixteen miles, of which the first fourteen miles traverse some of the wildest moorland in England.' It seems more or less appropriate that these 'knives' should point that way!

* Since writing this, I have learned that the term 'Cave-earths of North Wales' is used by Prof. Marr to designate what Sir William Dawkins described as 'Neolithic Caves' of North Wales, and not the true Cave-earths of Tremeirchion, Ffynnon Beuno, etc., which are of much earlier date.

FUNGUS FORAY AT CASTLE HOWARD.

A. E. PECK.

THE Mycological Meeting of 1921 (the 296th Meeting of the Union) was held from October 1st to October 6th, with Headquarters at Park House, Castle Howard. Members of the Committee present were:—Harold Wager, D.Sc., F.R.S., F.L.S., Chairman, (Leeds), W. N. Cheesman, J.P., F.L.S. (Selby), J. W. H. Johnson, M.Sc., F.L.S. (Walton), F. A. Mason, F.R.M.S. (Leeds), R. Fowler Jones (York), J. Ackroyd (Batley), Thos. Smith (Stockport), Greevz Fysher (Leeds), and A. E. Peck, Hon. Sec. (Scarborough).

The following members of the Union and friends were also present, and completed the goodly attendance of twenty persons:—H. B. Booth, F.Z.S., M.B.O.U., President of the Yorkshire Naturalists' Union, and Mrs. Booth; Mrs. Greevz Fysher, Miss Fysher, Mrs. Peck, W. G. Bramley (Fairburn), Rev. Geo. Howard Chilman, M.A. (Dalton), W. L. Jefferson (Coneythorpe), Clyve C. Laverack (Malton), Miss Minnie P. Williams (Malton), and Miss Daisy Hilary (Bingley).

At the Business Meeting, the name of Miss Hilary was added to the Mycological Committee, and the President, Mr. Booth, was cordially welcomed and thanked for his presence. The last Fungus Foray held here was in 1909 (see *The Naturalist*, December 1909).

The Beech trees forming the roadside avenues received early inspection, and were found to be suffering severely from attacks of *Fomes fomentarius*, *Armillaria mucida* and *Pholiota squarrosa*. These parasites were numerous on old Beech trees all over the estate. The old Oak trees of Raw Wood produced a good crop of the Beef Steak Fungus, *Fistulina hepatica*, and this fungus was also found in another direction growing on a Sweet Chestnut tree. The 'Beef-Steak' is said to be the cause of a deep red-brown decomposition in oak. It is recorded by Worthington Smith as having been found on trunks of Oak, Ash, Walnut, Willow, Beech, Chestnut, Hornbeam and Elm. C. Crossland, in the 'Fungus Flora of Yorkshire,' states that 'it has occurred on Hornbeam and Beech.' Present members have not previously seen it on other host than Oak.

Another polypore of unusual interest was *Polyporus Schweinitzii*, discovered on an old Larch tree in Quarry Wood, on the trunk, about six feet from the ground. This fungus is spongy-soft, and water-bearing, and is described as usually growing about the roots of fir, pine and larch. Mr. Carleton Rea describes this as a very destructive parasite, and, in the present instance, regrets to hear of its occurrence so far north. There are only two previous Yorkshire records, viz., at Farnley Wood and Scarborough, so that the county may be thankful for the rarity of this interesting fungus.

Among the Agaricaceae the genus *Amanita* was here well represented, the poisonous *Amanita phalloides* and *A. mappa* being particularly numerous. *Leptonia incana*, a pretty little pink-spored Agaric with a green stem, was found in fair good numbers on roadside grass between Coneysthorpe and Terrington. Dr. Wager has made a special study of this fungus, and its discovery was hailed with pleasure.

A gratifying feature of this meeting was that addresses were delivered on each evening of the meeting: Dr. Wager lectured on 'The Philosophy of Mycology'; Mr. C. N. Cheesman described *Schizophyllum commune*, a rare agaric collected during the Worcester Foray of the British Mycological Society; Mr. Mason gave 'Some Notes on the Genus *Penicillium*'; and Mr. Peck, taking the specimens of fungi collected during the foray, made them the subject of a talk on 'The Study of the Fungi.'

List of species not previously recorded for the Castle Howard district:—

- Lycoperdon echinatum* Pers.
Scleroderma verrucosum Bull.
Amanita virosa Fr.
Amanitopsis fulva Schff.
Lepiota rachodes (Vitt.) Fr.
Tricholoma brevipes (Bull.) Fr.
 **T. humile* Pers., var. *blandus* Berk.
 ***T. cnista* Fr.
T. spermaticum Fr.
T. frumentaceum Fr.
T. resplendens Fr.
T. variegatum (Scop.) Fr.
 ***Clitocybe infundibuliformis* (Schff.) var. *membranaceus* (S. & S.) Fr.
C. nebularis (Batsch.) Fr.
C. dealbata (Sow.) Fr.
C. geotropa (Bull.) Fr.
C. fragrans (Sow.) Fr.
C. brumalis Fr.
Collybia butyracea (Bull.) Fr.
Mycena rugosa Fr.
M. galericulata (Scop.) var. *calopoda* Fr.
M. haematopoda Fr.
 ***Omphalia pseudoandrosacea* (Bull.)
Pleurotus ostreatus (Jacq.) Fr.
 **P. corticatus* Fr. (on Beech).
P. dryinus (Pers.) Fr.
P. tremulus (Schff.) Fr.
P. applicatus (Batsch.) Fr.
 **Hygrophorus metapodius* Fr.
 **H. pratensis* (Pers.) var. *cinerea* Fr.
 ***Hygrophorus nitratus* (Pers.) var. *glauconitens* Fr.
Lactarius chrysorrheus Fr.
L. subumbonatus Lindgr.
Russula subfoetens Sm.
R. olivascens Fr.
R. consobrina Fr. var. *sororia* Fr.
Nyctalis asterophora Fr.
Pluteus nanus (Pers.) Fr.
P. umbrosus (Pers.) Fr.
Entoloma repandum Bull.
E. prunuloides Fr.
 **Leptonia lazulina* Fr.
Inocybe violaceo-fusca Cke. and Mass.
Cortinarius (Tel.) *hemitrichus* Fr.
 ***Cortinarius* (Derm.) *infucatus* Fr.
Hypholoma pilulaeforme (Bull.) Fr.
H. hydrophilum (Bull.) Fr.
Psilocybe sarcocephala Fr.
Coprinus fimetarius (Linn.) var. *cinereus* Fr.
 **Psathyrella caudata* Fr.
Boletus elegans (Schum.) Fr.
B. versipellis Fr.
Fistulina hepatica Fr. (on Oak and Sweet Chestnut).
Polyporus melanopus Fr.
P. frondosus Fr.
 **P. heteroclitus* (Bolt.) Fr.
P. Schweinitzii Fr. (on Larch).
Fomes fomentarius Fr.
 ***Trametes Bulliardii* Fr.
Phlebia merismoides Fr.

** First Yorkshire record.

* First record for N.E. Division, V.C.62.

- Phlebia radiata* Fr.
Odontia farinacea (Pers.) Fr.
 ***Solenia anomala* Fr.
Corticium laeve (Pers.) Fr.
C. lactescens Berk.
C. praetermissum (Karst.) Bres.
C. confluens Fr.
 ***Hypochnus fuscus* (Pers.) Karst.
Peniophora pallidula Bres.
P. gigantea (Berk.) Fr.
 **P. pubera* (Fr.) Mass.
P. velutina (Berk.) Fr.
P. hydroides Cke. and Mass.
P. crenea Bres.
Coniophora puteana (Schum.) Fr.
 ***Sebacina incrustans* Tul.
Clavaria aurea Schff.
- Clavaria persimilis* Cotton.
Tremella frondosa Fr.
T. lutescens Pers.
Hypomyces rosellus (A. & S.) Tul.
Poronia punctata Fr.
Leotia lubrica Pers.
Tapesia cassia Tul.
Coryne sarcoides Tul.
 ***Libertella faginea* Deem.
 ***Peronospora Rumicis* Corda.
 ***P. Polygoni* Thuem.
 **Puccinia coronata* Corda, on
Holcus mollis.
 **Melanconis stilbostoma* (Fr.) Tul.
 **Tilachidium tomentosum* (Schrad)
 Lindau.

Mr. W. N. Cheesman was in charge of the Mycetoza, and at the end of the foray his list totalled thirty-two species. The following are additional records for the district:—

- ***Physarum viride* Pers. var. *aurantium* Lister.
 **Didymium difforme* Duby.
 ***D. clavus* Rost.
 †*Stemonitis herbatica* Peck.
 **S. ferruginea* Ehrh.
 **Comatricha typhoides* (Bull.) Rost.
- **Tubifera ferruginosa* Gmel.
 ***Lamproderma columbinum* Rost.
 **Trichia persimilis* Karst.
 **T. contorta* Rost.
 **Arcyria ferruginea* Saut.
 **A. pomiformis*. (Leers.) Rost.
 **A. nutans* (Bull.) Grev.

* Not previously recorded for Castle Howard.

** First record for N.E. Division.

† First record for Yorkshire.

The resupinates were kindly determined by Miss E. M. Wakefield, of Kew, and Mr. A. Clarke and Mr. F. A. Mason have assisted in the arrangement and annotation of the list.

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'Gilbert White as Botanist,' by D. B. Morris, appeared in *The Selborne Magazine*, No. 348.

The Irish Naturalist for January contains 'Thirty Years' Work of *The Irish Naturalist*,' by Dr. R. F. Sharff, and shorter notes.

The Whitstable Oyster Fishery, 'probably the oldest in existence,' is described by Beryl Couper in *The Mariner's Mirror* for December.

We notice that, as a result of Dr. Scharff's appeal, financial assistance has been received, and the continued issue of *The Irish Naturalist* is assured.

'The White Border of *Euvanessa antiopa* L.' and 'Rearing *Callimorpha quadripunctaria* (hera),' are two of the items in the December number of *The Entomologist's Record*.

In *The Wiltshire Archæological and Natural History Magazine* for December, the Rev. E. H. Goddard has a paper on 'Stone Implements of Uncommon Type found in Wiltshire,' which is accompanied by illustrations bearing a striking resemblance to those figured in Hull Museum Publication No. 122, in which many Yorkshire specimens are illustrated and described. This latter publication is referred to, to some length, in the *Wiltshire Magazine*, and it is noteworthy that one of the Bridlington type of conical basalt axes is figured, and is said to have been found at Mildenhall.

NORTH-COUNTRY HYMENOPTERA.

GEO. B. WALSH, B.Sc.

WHILE in search of beetles, I have gradually collected a few little-known Hymenoptera, which I have lately submitted to Mr. Claude Morley. None of the species is recorded in the insect lists of the Victoria County Histories.

ICHNEUMONIDAE:—*Spilocryptus abbreviator*, Scarborough (sweeping, 26-7-1921); Tollesby, near Middlesbrough (in stack refuse, 10-12-1910). *Cremnodes atricapillus*, generally a rare species, Raincliffe Woods (18-10-1919, in dead leaves). *Hemiteles subzonatus*, Scalby (in cut grass, 25-7-1919). *Phygadenon gravenhorsti*, Scarborough (sweeping, 26-7-1921). *Pezomachus fasciatus* Fabr., Ravensworth Woods, near Gateshead (sweeping, 20-10-1917); Pickering (sweeping, 17-8-1921); Seamer Moor (sweeping, 12-11-1919); Brampton Cumberland (sweeping, 5-9-1915). *P. festinans* Grav., Whitely Bay (in grass on the edge of the sand, 6-7-1918). *P. aemulus* Först., Seamer Moor (sweeping, 12-9-1919). *P. corruptor* Först., Middlesbrough. *P. carnifex* Först., Ravensworth (sweeping, 20-10-1917); Gibside, near Newcastle (in dead leaves, 22-4-1916); one specimen is at least twice the size of another taken with it. *P. formicarius* Fabr., Middlesbrough. *P. modestus* Först., Seamer Moor (sweeping, 12-9-1919); Gibside (in dead leaves, 22-4-1916). *P. intermedius* Först., Kildale, N. Yorks (moss, 21-2-1914); Richmond, Yorks. (sweeping, 17-8-1914); Stony Marl Moor, above Robin Hood's Bay (under felted alga in a damp place, 24-8-1921); Dilston Woods, Hexham (moss, 22-4-1917); this species shows great variation in size and colouring. *P. instabilis* Först., Eston Nab, near Middlesbrough (in bracken refuse, 12-2-1910). *P. agilis* Grav., Scalby (in cut grass, 22-7-1919); Middlesbrough. *P. pumilus* Först., Eston Nab (in bracken refuse, 12-2-1910).

BRACONIDAE:—*Chiasmodon apterus* Nees, Scalby (in cut grass, 22-7-1919); Barnard Castle, Co. Durham (cut grass, 12-8-1916).

PROCTOTRYPIDAE:—*Lagynodes pallidus* Boh., Middlesbrough; Ravensworth (vegetable refuse, 1-4-1916); Chopwell, Co. Durham (moss, 17-10-1914); Gibside (dead leaves, 22-4-1916). *Paracodorus apterogynus* Hal., Middlesbrough (walking on path, 1-8-1910). *Aclista subaptera* Thoms. Chopwell, (sweeping, 20-5-1916). *Bechylus cephalotes* Först. Harwood Dale (28-3-1921).

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We have received Part 1 of *The Outline of Science*, edited by Prof. J. Arthur Thomson (G. Newnes, Ltd., 40 pp., 1/2 net). The work is to be completed in about 20 fortnightly parts, and if those to follow are as fascinating and as well illustrated as the one before us, the work will do much to popularise science. 'The Romance of the Heavens,' and 'The Story of Evolution' occur in this section.

In Memoriam.

GEORGE STEWARDSON BRADY, F.R.S.

DR. G. S. BRADY, who died at Sheffield on Christmas day, was born at Gateshead in 1832. The son of a surgeon, of Quaker stock (like so many another excellent naturalist), he followed his father's profession, and after studying at the Newcastle College of Medicine, he settled in Sunderland, where he was engaged in medical practice for close on half a century. His father's house has been described by one who knew him as 'one of those charming Quaker abodes where strength and quietude sit side by side, and where homely plenty and orderly preciseness hide for a moment from the stranger the intellectual activity which is filling the place.' In this home atmosphere G. S. Brady, like his brother, the late H. B. Brady, seems early to have turned his attention to Natural History, for in 1849 we find him becoming a member of the 'Tyne-side Naturalists' Field Club.' In 1875 he was appointed Professor of Natural History at the University of Durham College of Science in Newcastle, combining the duties of the chair with those of his medical practice until 1906, when he was compelled by the weight of years to retire from both.

Apart from a few papers and addresses on more general subjects, G. S. Brady's published work deals almost exclusively with the minute Crustacea that are commonly (though wrongly) grouped together as Entomostraca. A complete list of his papers would be a lengthy one, and we can only mention here his reports on the 'Challenger' Ostracoda (1880), and Copepoda (1883), the 'Monograph of the free and semi-parasitic Copepoda of the British Isles' (Ray Society, 3 vols., 1878-80), the monographs written in association with T. Rupert Jones and others on British Fossil Ostracoda (Palæontographical Society, 1874-84), and, in association with Canon A. M. Norman, the 'Monograph of the Marine and Freshwater Ostracoda of the North Atlantic and of North-western Europe' (Royal Dublin Society, 1889 and 1896).

Much of Brady's work was that of a pioneer in a field where earlier labourers had been few, and where the well-beaten tracks of to-day did not exist. Like all pioneers he made mistakes which his successors have rectified. He was mainly a faunistic naturalist and not a morphologist in the modern sense, and it is not surprising that, with the lapse of time, many of his views on classification have proved inadequate. Nevertheless, he discovered and described a vast number of new and interesting forms, and he did more than any other single investigator to elucidate the Ostracod and Copepod fauna of the British seas. Certain German writers, while profiting by his labours, have thought fit to refer to his work in somewhat contemptuous terms. A juster estimate may

be formed by any one who will turn the pages of the volumes on Copepoda in Prof. G. O. Sars's great work 'The Crustacea of Norway,' where he will find Brady quoted on almost every other page, often with agreement, sometimes with dissent, but always with respect.—W. T. CALMAN.

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The Scottish Journal of Agriculture during 1921 has contained a series of papers on 'Common Weeds,' by Dr. W. G. Smith.

The Publishers' Circular for January 7th, in referring to Col. Lyons' criticism in *Nature* of the late Sir Norman Lockyer's alleged dating of Stonehenge and other monuments by astronomical methods, says: 'We shall hold our breath until Sir Norman replies.' As Sir Norman is in heaven, it seems likely that *The Publishers' Circular* will expire!

The January number of *Discovery*, received December 20th, contains the editorial statement that 'There is obviously room for a magazine that attempts to keep abreast of contemporary developments and discoveries in the ever-increasing spheres of human activity and intellectual endeavour. In these the year 1921 has, indeed, been very rich.' The index to the contents of the twelve parts for the year 1921 occupies two columns on one page!

Among the contents of *The Scottish Naturalist* for November, we notice 'The Last of the Indigenous Scottish Capercaillies,' by H. S. Gladstone; 'The Eastern Lesser Whitethroat, an Addition to the British Avifauna'; and the Yellow-legged Herring Gull, a New Record for Scotland,' by W. E. Clarke and J. H. Stenhouse; and 'A Rare Crab (*Pirimela denticulata*) in the Firth of Forth,' by W. E. Evans, together with many smaller notes.

Bulletin No. 4 of the *Bureau of Bio-Technology* has appeared, and apparently the publication is going to extend its scope in the future. Among the contents of the present issue we notice: 'Micro-Organisms in the Leather Industries'; 'A Laboratory note on the Control of *Tragoderma khapra*,' by T. Parker and A. W. Long; 'Note on Medalia's Method of Determining Hydrogen Ion Concentration'; and Chart of the Biology of Leather Manufacture.

Dr. Alexander Meek has issued the *Report of the Dove Marine Laboratory, Cultercoats, Northumberland*, for 1921 (111 pp., 5/-). It contains a remarkable collection of statistics relating to the Fisheries of Northumberland, by the editor, under the head of 'Northumberland Trawling Experiments,' and he also contributes a note on the 'Pollution of the Tyne' B. Storrow writes on 'Herring Shoals,' and Dorothy Cowan on the 'Size of Herrings.' There are also valuable 'Faunistic Notes.'

In the *Report of the Geological Survey Board* for 1920 (the first report of this particular Board), reference is made to gifts to the Jermyn Street Museum of a large collection of Jurassic Mollusca formed by the late W. H. Hudleston, presented by Miss Raisin; a large and fine collection of sponges from the Upper Chalk of Yorkshire presented by Mr. G. W. Lamplugh; and 500 specimens of Mollusca from the Crag of Oakley, presented by Mr. F. W. Harmer. From this report we gather that there is still another Society in existence, namely 'The Royal Society of Antiquaries.'

We are glad to notice that printing conditions have so much improved that Mr. J. W. Taylor has been able to continue the publication of his *Monograph of the Land and Freshwater Mollusca of the British Isles*, part 24 of which recently appeared. It deals with *Xerophila itala*, *X. neglecta* and *X. virgata*, and there is an excellent coloured plate of the two first-named species, illustrating their extraordinary variation. Throughout, the monograph is illustrated by views of typical localities, portraits of authors, etc.

FIELD NOTES.

BIRDS.

Little Auk near York.—During very severe weather a specimen of the Little Auk was shot on Clifton Ings, on November 12th, by D. Ashby, York.—SYDNEY H. SMITH.

Water Rail at York.—A Water Rail was killed on the night of November 11th/12th, on the railway at York, by collision with the telegraph wires, and sent to me by Mr. J. Audaer.—SYDNEY H. SMITH.

Mealy Redpolls at Scarborough.—On December 4th I saw four Mealy Redpolls feeding upon nettles near the Scarborough Mere. On December 5th they were apparently not far from the same place, and I have seen them on one or two occasions since. They were very tame, and permitted a near approach.—T. N. ROBERTS.

Shag at York.—A fine adult specimen of this rare visitor was killed on the River Ouse near Marygate Landing, York, practically in the middle of the city, by Mr. Cyril Peacock, on January 6th, 1922. The bird, which is new to our local list, I saw in the flesh, and its twelve tail feathers make the identity certain.—SYDNEY H. SMITH.

Bittern at Scarborough.—On December 17th a Bittern visited some marshy ground not far from the town. It was disturbed from a small patch of reeds, and alighted again on an adjoining larger patch, where it stayed for some time, and allowed me to have a splendid view of it, as it stood with its beak pointing upwards, an attitude peculiar to the species.—T. N. ROBERTS.

Rare Birds in the Wilsden District.—On December 12th, quite a spring-like day, when coming to Wilsden from Beckfoot, on crossing a patch of coarse grass at the south-west edge of Bingley Wood, a small flock of eight to ten birds rose almost at my feet with a tremendous whirring noise. These birds, I have little or no doubt, were Quail. I distinctly heard the loud cry of the Wryneck in the park between Bingley Wood and Beckfoot in April, a few years ago. Another rare bird I had the pleasure of seeing in October, 1916. I then kept poultry in a small wood near this village, through which a stream of water runs, and on going to one of my cotes I saw a small bird with a white rump fly behind the cote, and on running up to the cote, I had a fine view of Coues's Redpoll feeding on the seeds of meadow sweet, which all the Redpolls are exceedingly fond of. Another bird, a Richard's Pipit, which I saw one November afternoon a few years ago has never been recorded in *The Naturalist*. At the same time I saw, I think, other two feeding a few yards from the edge of the manure, and on jumping the wall, one of the birds allowed me to approach somewhat close. Its outer tail feathers, when it flew, were white, but its manner of walking was what struck me most, and its large size. Two Turtle Doves

were flying about Bingley Wood all the summer of 1916, but no nest was found. Goldcrests are not only common, but abundant in Bingley Wood, this autumn, more so than I have ever seen them in previous years, but breeds there very rarely. In October, I saw a large flock of Fieldfares feeding on the berries of the white beam tree near Cullingworth, and also two Crossbills on the seeds of the berries.—E. P. BUTTERFIELD.

MAMMALS.

Ermine Stoat near Hull.—I procured a pure white Ermine Stoat on Saturday, December 24th, 1921, in Keyingham Marsh, with not the slightest sign of creaminess nor any other speck of colour but the tail tip. We must surely look for some other reason than climatic severity for the phenomena of change in our indigenous Stoats, as this occurs in the most open season on record.—CHAS. F. PROCTER.

Erythristic Badgers.—I have to thank Miss Frances Pitt for the following additional record, which is of special interest because the fact that in this specimen also the eyes were pink, shows that erythrism is very near to albinism, both being produced by the elimination of the colour factor. Miss Pitt writes:—‘ In the spring of 1895 a female Badger, “sandy” in colour, was dug out in the Crunnals Dingle, Deuxhill, Bridgnorth. My father had her for some time. She had pink eyes.’—H. E. FORREST.

Otters destructive to Birds.—Referring to the note on p. 400 of *The Naturalist* for 1921 about Great Crested Grebes rearing so few young; Otters are at times destructive to birds frequenting water inland. As these mammals not uncommonly do such deeds during the night, the authors of the mischief are liable to be overlooked. Otters will produce young at any time of the year, while the nesting times of the birds are limited, so a little judicious thinning-out of Otters (should they frequent the neighbourhood of Fairburn) might result in more Grebes being reared next year.—FREDERICK D. WELCH.

The waters frequented by the Great Crested Grebe are usually well stocked with Pike. This fish is far more responsible than the Otter for the destruction among the young of the Grebe and other water-fowl. In comparison with Pike, the damage done by Otters in this way is negligible.—R. F.

FISHES.

Big Ure Trout.—A local angler live-baiting for pike at Hewick Bridge, near Ripon, on January 7th, hooked a large trout which, after a struggle, he succeeded in landing. Unfortunately, the fish had swallowed the bait (a six inch roach), and hooks, the extraction of which so injured him that he died. The weight some hours after death was exactly 5½ lbs.—R. FORTUNE.

ROTIFERS.

Yorkshire Micro-Biology Committee.—The following should have appeared in the Annual Report of the Yorkshire Naturalists' Union, printed in *The Naturalist* for January :— J. W. H. Johnson reports the lack of rain during the past season has not been favourable to those interested in the aquatic forms. In spite of these conditions, Mr. Chas. Barlow has furnished a good list of rotifers, found by him in the Pateley Bridge district. Mr. E. Percival, of Leeds University, records the occurrence of *Trypanosoma lewsi* among rats in the Leeds area ; large quantities of sexually mature *Hydra viridis* from Sandhills, Thorner, and also *Vortex viridis* from pools in the same district. As many of the older members are unable to take an active interest in the work of this section, it is now desirable that other members should proffer assistance.—J. W. H. JOHNSON.

ENTOMOLOGY.

Necrobia rufipes at Newsome.—Living specimens of this beetle were handed to me by our local schoolmaster, captured in his house, on the 20th November last. I am indebted to Mr. M. L. Thompson for determining the species, which is new to the Huddersfield district.—W. E. L. WATTAM.

Lancashire and Cheshire Entomology.—At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. A. E. Wright exhibited the Tineid moth, *Blastobasis lignea* Wslm. and its variety *adustella* Wslm., taken in North Lancashire and new to Britain ; also a specimen of *Eromene ocella*, captured at light at Grange in September last. Mr. W. Buckley shewed a series of *Lycaena icarus*, and a specimen of the under-side var. *radiata*, all taken at Delamere last May. Mr. W. Mansbridge shewed the best forms selected from a very large number of *Peronea hastiana*, bred last autumn from larvae found on the Lancashire coast ; vars. *autumnana*, *albistriana*, *leucopheana*, *mayrana*, *combustana*, *divisana* and *radiana* were represented. Mr. R. Tait read the Presidential address entitled 'The Life-history of *Agrotis ashworthii* up to date.' Mr. W. Mansbridge exhibited a short series of melanic *Tephrosia consortaria* bred from a female taken at Wimbledon by Mr. A. W. Buckstone in 1920.—WM. MANSBRIDGE, *Hon. Sec.*

FUNGI.

Pluteus cervinus (Schoeff.).—Early in October, 1921, four 'typical well-grown specimens' of this fungus appeared in my garden, for the identification of which I am indebted to Mr. Alfred Clarke. Although it is described as a common species, it appeared on a manure heap, where there are neither 'old stumps nor rotting trunks.' The pileus of each specimen measured four and a half inches across, although sometimes larger specimens are found.—CHARLES MOSLEY, Huddersfield.

YORKSHIRE NATURALISTS' UNION :
ENTOMOLOGICAL SECTION.

THE Annual Meeting of this section was held at Leeds, Dr. E. O. Croft presiding. Reports of the various committees were read. A supplementary report on lepidoptera included the following records:—Second broods of *Caradrina quadripunctata* and *Agrotis segetum* at Shelley in October (Dr. H. D. Smart), *Thera obeliscata* and *T. firmata* at Skipwith in August (Rev. C. D. Ash), *Dianthoecia carpophaga* at Huddersfield, where the species is new (Mr. G. T. Porritt). Mr. T. Ashton Lofthouse found *Thecla rubi* as noticeably early on April 12th at Glaisdale, a specimen of *Nemophila noctuella* taken in his garden at Linthorpe he thinks is possibly a migrant. He also took *Coccyx argyvana* and *C. splendidulana* at Ingleby Greenhow in April, and bred *Poedisca semifasciana* from Askham Bog ; a single specimen of *Glyphypteryx haworthana* at Pilmoor and *G. equitella* at Wycliff on the Yorkshire side of the Tees. Mr. Ash again found *Nonagria arundineta* and its variety *dissoluta* in the Wharfe valley. Mr. Walter Greaves found *Epinephle ianira* in Crimsworth Dene, Hebden Bridge, on July 9th ; this species does not seem to have been noticed for some years in the South Western part of the county.

Dr. H. D. Smart exhibited a series of *Pieris napi* from Portugal and the Cambridge Fens, a melanic *Noctua xanthographa* from Shelley, and a series each of *Zygaena lonicerae* and *Z. filipendulae*, along with specimens that apparently are hybrids between them, from Filey, and *Z. hippocrepidis* and *Z. trifolii* for comparison.

Mr. B. Morley showed a series each of *Acronycta menyanthides* with a melanic form from the West Riding Moors ; *Noctua glareosa* and its var. *rosea* ; extremely variable *Triphaena fimbria* ; melanic, and melanic *rufescens* forms, of *Cidaria truncata* ; *Peronea ferrugana* and *Teras contaminana*, all from the West Riding ; and *Sesia andreniformis* with its mine and pupæ from Surrey.

Mr. E. G. Bayford showed *Sirex juvencus* from Barnsley, the fourth British specimen, all four have been taken in South West Yorkshire ; he also showed agamic form and galls of *Biorhiza pallida* from Cawthorne, and *Pentatoma prasina* from Barnsley.

Mr. F. Rhodes passed round *Bombus distinguendus*, a social bee from Sunny Dale, and *Notonecta maculosa* and *N. glauca* from Heaton ; and *Dictyonota crassicornis*, Sunny Dale.

Mr. C. A. Cheetham made interesting reference to the work done among Diptera and showed examples of the following, all additions to the County list:—*Pachyrrhina scurra* Mg. ; *Urellia stellata* Fuessl., Skipwith ; *Toxoneura muliebris* Harr. ; *Neottiophilum praeustum* Mg., Farnley ; *Euaesta conjuncta* Lis., Allertorpe ; *Phaeomyia fuscipennis* Mg. ; *Conops flavipes* L., Nidd ; *Xylota lenta* Mg. ; *Ardoptera irrorata* Yall., Rawdon ; *Tipula signata* Staeg. ; *Oxycera pardalina* ; *Therioptectes montanus* Mg. ; *Didea intermedia* Lu. ; *Dexia vacua* F. ; *Helomyza variegata* Ln., Austwick ; *Hydrophorus borealis* Ln., Helwith Moss ; *Pipunculus littoralis* Bkr., Redcar ; and *Syrphus annulipes* Ztt. from Pateley Bridge.

Mr. W. Falconer handed round many Yorkshire galls, comprising species of Hymenoptera, Diptera, Homoptera and Mites, *in situ* on their pabulæ. The most interesting were:—HYMENOPTERA : *Isosoma graminicola* Gir. on couch grass, new to Britain ; DIPTERA : *Perrisia acerocrispans* Kieff. on maple, and *Rhopalomyia tanaceticola* Karsch. on tansy, new to Yorks. ; *Lipara lucens* Mgn., and larva, on *Phragmites communis*, new to the North of England. *Atrichosema aceris* Kieff. on maple, new to the North of England. HOMOPTERA : *Pemphigus filaginis* Boyer. on black poplar, new to Yorks., and *Asterodiaspis quercicola* Bché. on oak, new to the North of England.

Mr. W. J. Fordham exhibited the following:—COLEOPTERA : *Hydrophorus borealis* and *Helophorus porculus* from Sandsend ; *Ocyusa maura*, *Stenus carbonarius* and *S. argus*, three species new to Yorkshire, from Bubwith ; *Haltica britteni* from Ravenscar. HYMENOPTERA : *Ammophila*

sabulosa, *Homalus auratus* and *Mellinus arvensis* from Allerthorpe; *Psithyrus distinctus* var. *subrufipes* from Ilkley, the last two species being new to Yorkshire. DIPTERA: *Neotamus cyanurus*, *Dioctria baumhaueri* and *Lasiopogon cinctus*, new to Yorkshire, from Allerthorpe; *Eutarsus aulicus* and *Porphyrops nasuta*, new to Yorkshire, from Bubwith.

Mr. M. L. Thompson exhibited the following Coleoptera, which he added to the list during the year:—*Heptaaulacus villosus* and *Hapalareia pygmaea*.

A varied collection of species, mostly obtained in the immediate neighbourhood of Leeds, was exhibited by three members of the Leeds Naturalists' Club.—B. MORLEY, Hon. Sec.

—: o :—

YORKSHIRE NATURALISTS AT HULL.

THE Sixtieth Annual Meeting of the Union was held in the Museum, Hull, on Saturday, December 3rd last, the proceedings being opened by the General Committee Meeting in the afternoon. After the formal adoption of the Balance Sheet and Report, the President, Mr. H. B. Booth, announced that the Presidency of the Union for 1922 had been offered to and accepted by Dr. T. W. Woodhead, F.L.S.

The invitation of the Scarborough Philosophical and Archæological Society was accepted, and it was decided to hold the next Annual Meeting at Scarborough in December, 1922.

At the evening Meeting the Chair was taken by the Rt. Hon. the Lord Mayor, Councillor G. F. Wokes. After the election of ten new members, Mr. H. B. Booth, M.B.O.U., F.Z.S., delivered his Presidential Address, 'The Migration of the Swallow,' to a highly appreciative audience. This Address will appear in *The Naturalist*. A hearty vote of thanks to the President was carried on the motion of Prof. J. H. Priestley, seconded by Dr. T. W. Woodhead.

The President then referred to the resignation, at the last General Meeting, of the Honorary Secretaries, one of whom, Dr. Woodhead, had since been elected President of the Union. He alluded to the general feeling that the Union should also recognise the sterling services of Mr. W. E. L. Wattam as Secretary. Subscriptions had been invited for this purpose, and he had much pleasure in asking the Lord Mayor to hand to Mr. Wattam a collection of suitable books, etc., as a small appreciation of the work the latter had done for the Union.

After a few appropriate remarks, the Lord Mayor presented the testimonial to Mr. Wattam, who, in response, expressed his appreciation of the gift, and mentioned the pleasant memories which had resulted from his connection with the Union.

The thanks of the Union were then tendered to the Lord Mayor, and to Alderman J. Pybus as Chairman of the Museums Committee. Mr. T. Sheppard, M.Sc., F.G.S., and the local Societies were also sincerely thanked for their supervision of the necessary arrangements.

Those present then adjourned to a Conversazione in the Hall of the Museum, and a very pleasant time was spent in examining and admiring the exhibits. Refreshments were provided through the kindness of the Hull Scientific and Field Naturalists' Club and the Hull Geological Society.

—: o :—

Dr. W. D. Lang, of the Geological Department, British Museum, in reply to Dr. F. A. Bather, of the British Museum, at a recent meeting of the Geological Society of London, stated 'that he had collected many lamellibranchs and other fossils from the Shales-with-Beef, but had not found a specialist to name any, except the ammonites.' This makes the outlook somewhat hopeless for an amateur in the provinces!

NORTHERN NEWS.

The Thirteenth International Geological Congress will be held in Belgium in August.

The death is announced of Sir German Sims Woodhead, Professor of Pathology in the University of Cambridge. He was born at Huddersfield on April 29th, 1855.

The *Fourteenth Report of the National Museum of Wales*, Cardiff, contains a plate illustrating important British and Roman remains recently added to the collections.

Parts 2 and 3 of *The Outline of Science* (George Newnes, 1/2 net each) deal with the Story of Evolution, and the Ascent of Man, and contain numerous coloured and other illustrations.

Prof. P. F. Kendall has accepted the presidency of Section 'C' (Geology) at the Hull Meeting of the British Association in September. The Hull Geologists are already at work in connexion with this meeting.

We regret to announce the death of Mr. A. E. Hall, of Cranfield House, Southwell, Notts., who formerly occupied an official position in the Entomological section of the Yorkshire Naturalists' Union. He was an occasional contributor to *The Naturalist*.

One of a group of Chilean tree, *Araucaria imbricata*, at Sewerby House, near Bridlington, has produced a large number of seeds from which healthy young plants have been raised. When the roots of a dead tree were being removed, large quantities of resin, set in hard amber-like masses, were dug up.

The New Phytologist for December contains, among other items, a study of some of the Factors Controlling the Periodicity of Freshwater Algae in Nature, by W. J. Hodgetts; 'A new species of *Caelastrum*,' by F. Rich; and 'An Unusual Plant of *Cheiranthus cheiri* L.' by E. M. Poulton.

In No. 308 of *The Quarterly Journal of the Geological Society*, Miss A. I. McDonald and Dr. A. E. Trueman have an interesting paper on 'The Evolution of certain Liassic Gastropods, with special reference to their use in Stratigraphy.' In this, Yorkshire and Lincolnshire specimens are described.

Among the New Year honours we are pleased to find the names of Professor W. A. Herman, of Liverpool, ex-President of the British Association for the Advancement of Science, and Alderman Edward Packard, of Ipswich, who takes so keen an interest in the Museum there; both of whom have received a knighthood.

The death is announced of Walter Morrison, of Malham Tarn, at the age of 85. He was a fine type of man in every way. Many of our readers knew him well, and he was ever anxious to support any movement for the improvement of his fellows. He was many sided in his activities, and probably got as much good out of his life, and principally by assisting good causes, as was possible. A fine memoir dealing with his career appears in *The Yorkshire Post* for December 20th.

Mr. Hans Schlesch has purchased the F. Booth collection of Marine and Foreign Fresh Water Mollusca, formed by Mr. F. Booth of Shipley, and presented it to the Municipal Museum at Hull, where it will form a welcome addition to the already extensive collection of Mollusca from all parts of the world, known as the Schlesch Collection. The Booth collection contains:—

Genera	Species	
190	1410	Marine Gastropods.
82	329	Marine Bivalves.
53	356	Brackish and Fresh Water Univalves.
3	14	Brackish and Fresh Water Bivalves.
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No. 782

No. 556 of current Series

MARCH 1922.

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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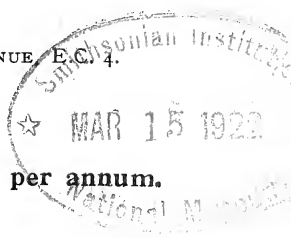
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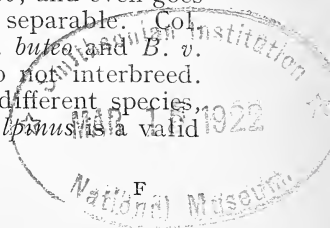
NOTES AND COMMENTS.

EGG-RAIDING AT THE FARNE ISLANDS.

In *Country Life* for February 4th, Mr. Riley Fortune has an illustrated article on the above subject. In the old days, the difficulty in reaching the islands by the rowing boats limited the number of visitors, and gave the birds a chance. 'Now a number of fishermen have acquired large motor boats with which they carry over a considerable number of passengers at a time; they also make more than one journey a day, and are there quite early in the morning, and bring parties over in the evening, a state of things previously unknown. On one day this year 200 people landed on the Brownsman, only a tiny island, and on one Sunday morning I counted forty-five people wandering haphazard all over the Tern colony, a very congested area, where Sandwich, Common, Arctic and Roseate Terns were breeding. The watchers (unfortunately, the Farne Islands Association have lost their experienced men, and since the war have had to do their best with men, estimable enough, whose knowledge of the birds and their ways is of the slightest) seemed to have the idea that they are there to act as showmen, and, instead of restraining visitors, accompanied them among the eggs and young birds, picking one up here and there for exhibition. One boy I saw pocket several eggs, but as they were addled, I did not interfere. This island was strewn with addled eggs, as a result brought about by the continued excessive disturbance of the birds.

EAST EUROPEAN BUZZARD.

As a sample of the work contained in H. Kirke Swann's 'Synopsis of the Accipitres,' referred to on another page, we give the following *footnote* in reference to Buzzards:—'Confusion has long existed regarding the East European Buzzards, and three years of hard work on the group brings me to the conclusion that the only way to overcome this confusion is to regard *B. vulpinus* as a species and "*zimmermannae*" [= *intermedius* Menzb.—this name claiming priority] as a form of this species and not of *B. buteo*. There is no doubt that *B. v. intermedius* is intermediate between *B. vulpinus* and *B. buteo*, but there is also no doubt that *intermedius* is the representative form in E. Europe and breeds there along with typical *B. buteo buteo*. Witherby admits this difficulty (Pract. Handbook Br. Birds, ii., p. 145, note) but follows Hartert in making *vulpinus* a form of *B. buteo*, and even goes further in doubting if "*zimmermannae*" is separable. Col. Meiklejohn tells me also that the typical *B. buteo* and *B. v. intermedius* nest together in Esthonia and do not interbreed. The inference is obvious that they must be different species, and as I have always been convinced that *vulpinus* is a valid



species, differing widely from *B. buteo* in adult plumage, in plumage changes, in size, and in habits as observed in the field, I feel that all difficulties are overcome by regarding *intermedius* as a form of that species, intermediate between it and *B. buteo*. One point that links the two latter forms is that both are not truly migratory, although they move in winter. *B. vulpinus vulpinus* on the other hand is a true migrant, going right down through Africa. This is unfortunate in one sense, because African migrants are always assigned to *vulpinus*, while European birds, especially the young with brown-barred tails, are as often as not confused with *intermedius* or *B. buteo*. *B. menetriesi* Bogd. is a synonym of *B. vulpinus vulpinus*, as it is based on old birds which have lost most of the tail bands. Mr. W. Sclater (MS.) states that in Socotra *B. vulpinus* or an allied form breeds.

A SHEFFIELD AXE.

An amusing and lengthy correspondence is taking place in a Sheffield newspaper between the Curator there, and, apparently, 'the rest of Sheffield,' in reference to a flint axe recently found in the district, which is not yet in the Sheffield Museum. One writer quotes a number of 'authorities' in support of his statement, viz., the British Museum, Messrs. G. Maynard, J. Reid Moir and T. Sheppard—a somewhat unexpected 'four-in-hand.' The correspondence shows a deplorable ignorance of elementary geological matters. One writer refers to the 'upper or flint-bearing' chalk of Yorkshire. The Upper Chalk of Yorkshire is flintless. In the same column, another writer states when Diatomaceae (*sic*)—microscopic animals (*sic*) which exist in 'colonies' on the surface of the ocean die, their bodies sink, and the hard parts, which are composed of silica, often form into nodules by concretionary action, or layers, in the ooze of the sea-bed. This ooze eventually becomes chalk.' (!) The diatoms are plants, with siliceous skeletons; the ooze consists largely of the hard parts of foraminifera, which are animals, and composed of carbonate of lime.

GEOLOGICAL LITERATURE.

The Geological Literature added to the Geological Society's Library during 1920 has just been published; this time without the subject index, possibly from the point of view of economy. We do not know who is likely to find the time to wade through about 3000 titles in order to ascertain what may have been written in 1920 relating to his particular subject, but in the absence of the usual subject index this will be necessary. The publication of a list of this kind, which is obviously intended for the use of the worker, without an index, is not only ridiculous, but a crime; and we cannot sufficiently condemn

the power or powers that be which caused such a volume to be published in its present form. It is a waste of money, and we sincerely trust that in future parts, the subject index will appear, and that instructions will also be given for a subject index to be issued for the list just to hand. If the question of funds is the excuse, then the best thing is not to publish the lists at all, and save even more money. Quite recently we received the list for 1913, which was properly indexed. We believe that the lists for 1915-1919 are in preparation, query, with indexes. Has 1914 been forgotten?

A FUNGUS FORAY.

Some years ago the following note was sent to us by a Barnsley visitor to one of the excursions of the Yorkshire Naturalists' Union. It was held over for a reason which, we regret to say, does not now obtain. He signed himself 'Myc Fuizeball,' and gave the following account of 'T' Fuizeball an' t' Toadstoil collectors at Grimethorpe,' in local dialect:— 'E' first plaace it'l be nessersary for ma to exsplane thet amung swarm fra Barnsler wor horf er duzen charming ladies fru t' adjesent naberhood o' Pogmoor, an wot tha went for a'll tell yer. Amung gang on em wor a nice little chap wi a box hat on is heead an a tin bacca box in is hand. Ahr forgew his name, but ther wur sum funny canibalising letters at end on't. Ohnyhar wi cressened im t' fungie man, an by gum wi worn't far wrang. E' wor getherin all soorts o' toadstoils, so'h to be e't fashon t' ladies serr of ter help im to feend em; tha' scoured thru t' Lady Wood an' t' New Park Spring Wood, an be time they met together agenn they fairley mazed fellow wi' t' various sooarts tha'a fon, which at seet on em is een fairley glissened; soa then e cahred hisen darn on t' gress. Wi a crawd raand him e' started wi is nomany, calling em all t' owdaceous names e could rip aart—t' fungie ahr meean, not t' ladies. Iverybody wor dumfahnded. Sum e niver seen afore, an sed tha wor probabler new to sihense; at ony rate unknown e' that part o' t' caarnty. They'd broat im enuff ter set up a mewseam wi, and then e' kongratulated t' ladies for thear efforts, aftereds he purrem in is box to tak hoam. Wun o' t' party axed if e het em wen e' got hoam? "Noa," e' sed; "ahr leave it t' wife as ter wether thaa reight er not, as't want to cum ageen." Iverybody wur soa interested t' opinion wor expressed that e should show at wun of t' Barnsler Sosity's meetin's wi t' lantern, an then noa daart it e'd be t' meean o' gettin sum o' t' members to tak up fungi getherin.'

A SWAN IN A MARE'S NEST.

In Mr. J. H. Gurney's 'Early Annals of Ornithology,' 1921, page 71, there is an illustration (reproduced in *The Naturalist*

for April, 1921, page 121) copied from an old manuscript, and described as representing 'Marking the beak and feet of a Swan' in the fourteenth century. This illustration is a copy of a woodcut in the illustrated edition of J. R. Green's 'Short History of the English People' (Macmillan, 1893), Vol. II., p. 481, where the legend reads 'Swan Hopping, A.D. 1338-1344. MS. Bodl. Misc. 264.' *The Naturalist* justly remarked that the method of bird-marking depicted seemed to be a very drastic one, but it appears to have escaped notice that there is an alternative explanation. In the list of 'Corrections and Additions' (unpaged), issued with the fourth volume of Green's 'History,' we find, with reference to this illustration, 'for "Swan-hopping" read "Shoeing a Swan; a mediæval jest."' There is no need to be either an archæologist or an ornithologist to believe that this second interpretation is the correct one. It is only necessary to compare the figure with the one immediately preceding it on the same page of the 'History,' which represents 'Shoeing Horse,' and is taken from the same MS., to be convinced that the artist intended his second picture to be a caricature of the first.—W. T. CALMAN.

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Galling of Couch Grass in Yorkshire.—In *The Naturalist*, p. 78, is a reference to galling of Couch Grass in Yorkshire by the Hymenopteron, *Isosoma graminicola* Gir. said to be a 'new to Britain.' Cecidia, associated with the same parasite, have been previously recorded from Cheshire (*Lancs. and Ches. Nat.*, 1919, p. 137). I omitted to include this in my recent contribution on Cheshire Zooecidia in that journal, though reference is made to the somewhat similar cecidia probably due to the same insect on the allied host *Agropyron junceum* Beauv.—A. A. DALLMAN.

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Lancashire and Cheshire Entomology.—At a recent meeting of the Lancashire and Cheshire Entomological Society, Mr. W. Mansbridge read his report, as Recorder of Lepidoptera, for the years 1920 and 1921. He mentioned that besides many interesting records, five species had been added to the Lancashire and Cheshire list in 1920, and five in 1921. These included one species new to Britain, viz., *Blastobasis lignea* Wlsm., and its variety *adustella* Wlsm. Mr. H. B. Prince exhibited a box of insects which he had bred from a number of larvæ caught in paper traps at Hightown. They included *N. triangulum*, *N. ditrapezium*, *A. fuliginosa*, *L. lithargyrea*, *T. gothica*, *T. baja* and *T. comes*. This is the first record of *ditrapezium* in Lancashire.—CHARLES P. RIMMER, *Hon. Sec.*

MIGRATION OF THE COMMON SWALLOW (*HIRUNDO RUSTICA* L.).

H. B. BOOTH, F.Z.S., M.B.O.U.

(Continued from page 60).

I should like to give a short quotation written by Colonel Legge of Ceylon. The birds referred to were *H. rustica*; but probably their homes would be in Western Asia. He says 'It arrives usually in the north of the island about the second or third week in September, the young birds coming in first. Its numbers are increased considerably in about a fortnight after its first appearance, and it then begins to spread southward, but irregularly, as its movements perhaps depend upon the break up of the south-western monsoon to some extent.'*

Mr. E. C. Chubb of the Rhodesian Museum, Bulawayo, writing 'On the Birds of Bulawayo, Southern Rhodesia,' says, † 'The Common Swallow (*H. rustica*), began to arrive here about the middle of October, and the greater number of them left again about the middle of April, although a few were seen as late as April 27th and 28th.'

Dr. R. Bowdler Sharpe in dealing with a 'Collection of Birds from the District of Deelfontein,' ‡ explains that Deelfontein is about 4700 feet above sea level and is situated in about the centre of Cape Colony. He also adds, 'The field-notes supplied to me by our young collectors, Seimund and Grant, of the Imperial Yeomanry, cannot fail to be of interest.' Under *H. rustica*, these well-known ornithologists remark, 'Very common in the winter months, the young arriving before the old birds, which follow about three weeks later.' This is an interesting note, as it shows that even so far south on the journey the old birds had not overtaken the young unguided birds. But no doubt with old and young birds travelling together, the speed would be regulated by the strength and power of endurance of the younger birds. This is very different from the journey north in our spring, when it is well-known that the more vigorous birds outstrip and leave their fellows in their apparent anxiety to get to their real home, and their breeding grounds. Dr. Sharpe comments on the state of the plumage of an adult male Swallow shot at Deelfontein, on December 13th, 1902: 'The December bird has completed most of the moult, but still retains the old quill-feathers.' Mr. W. L. Sclater, then the Director of the South African Museum, Cape Town, in 'A Paper read before Section D of the British Association,' at its meeting in Johannesburg in 1905, on 'The

* Sharpe and Wyatt, in 'A Monograph of the Swallows,' p. 226.

† *The Ibis*, 1909, p. 155.

‡ *The Ibis*, 1904, p. 315, etc.

Migration of Birds in South Africa,' says: * 'The English Swallow first arrives at the neighbourhood of Cape Town at the end of October, and becomes common in November; it remains here till March, and has entirely disappeared by mid-April.'

The birds arriving in Central and South Africa are not like the clean smart birds that arrived in England in the spring. This is what Sharpe and Wyatt, in 'A Monograph of the Swallows' say of them, † 'The Common Swallow arrives in its winter home in the same plumage in which it left in the previous spring, and, of course, by the time that it reaches its winter habitat the bird's feathers are bleached and worn out. The rufous of the forehead and throat becomes nearly white, and the beautiful blue colour of the back turns to a dingy brown, while the wings are rusty brown.'

Although the young birds have only performed a single journey, I am told that they are even in a worse plight than the older birds, by reason of their feathers being much softer and more tender.

Our Swallow does not breed in the South African summer, although I have several times heard this disputed by South Africans, or by Europeans who have lived in South Africa for a number of years. As already stated, our Swallow arrives as a spring or summer visitor in South Africa, just as it does with us. About the same time as our birds arrive, several other species of Swallow also arrive from the north, settle down, nest, and depart for the north into the tropics when our birds leave for the north. In other words they are summer migrants to South Africa. Amongst them are three or four species of the genus *Hirundo*, and one, the White-throated Swallow (*H. albigularis* Strickl.), which is rather difficult to distinguish from our Swallow on the wing. It builds a similar nest to our Swallow, and fixes it in a similar position and site, and its eggs are rather like the eggs of our bird.

A brother of a friend of mine, in South Africa, still persists that the English Swallow nests there. In order to prove it he sent home a nest and eggs (which got broken in transit), but he did not send the bird! The adult Swallow spends very nearly six months of the year in England. During the remainder of the year it has to perform a journey of anywhere between four and six thousand miles, moult every feather and every quill, and then return the same number of miles: it can well be imagined that it will have sufficient business on hand without nesting as well! As already stated, the Swallows leave Cape Town in March on their return journey north, excepting a few stray birds that occasionally may be seen during the first half of April. I don't attach much importance

* *Journal S. African Ornith. Union*, 1906, p. 16. † p. 216.

to these stray late birds, as they may be sterile or otherwise non-breeding birds which will probably only journey as far north as the southern nesting limit of their species. But when we get a little further north, say in the Transvaal, we find the Swallow not uncommon in April. I will quote two extracts from 'Reports of the Migration Committee of the South African Ornithologists' Union,' under the heading of European Swallow (Departures). At Modderfontein, Mr. A. Haagner, one of the best known South African field-ornithologists, reports for 1908, 'March 1st, saw them first massing on this date. Flocks seen flying north on the 11th, 17th and 30th March. Last few stragglers seen April 6th. Very cold, south winds.* At Komatipoort in the same state, Major J. S. Hamilton reports for 1909, 'March 8th, massing. April 20th, last flock; April 26th, last one seen.† A little further north, in the Matopo District, Southern Rhodesia, apparently the northern movement commences earlier, and, with passing birds, lasts later. Mr. L. B. Mouritz writes:‡ 'A very common summer visitor, which, in 1912, occurred as late as April 24th, when a small party, journeying northwards, passed over Lucydale. In February there are movements going on amongst our Swallows. On the morning of the 7th I noticed scores at dawn all perched on mealie stalks in an old cultivation, and, from lassitude, evidently travellers—our full complement of birds being scattered about the country as usual. On the 21st I noticed again several small parties of fifty or sixty which were evidently on migration. The main body of our local birds left for northern parts between the 12th and 15th of March.' At Bulawayo, Rhodesia, Mr. E. C. Chubb, Curator of the Museum there, writes of *H. rustica*, 'The greater number of them left about the beginning of April, although a few were seen as late as April 27th and 28th.‡ Further north again, in British East Africa, inland from Mombasa, Mr. G. H. Gurney writes, || 'Large flocks of *H. rustica* appeared on the Kapiti Plains in the fourth week of March, all on northward migration.'

On the other side of the great African Continent, and in the north-west, Mr. W. A. Bannerman has made a special study of the ornithology of the Canary Islands, and writes in *The Ibis*, 1919, p. 315, 'The Swallow is a regular bird of passage in spring and autumn, but is especially numerous in spring.' His two earliest spring records are in February, one on February 5th (1909), and the other February 28th (1887); then there is a jump to March 31st (1913), and another to April

* *Journal S. African Ornith. Union*, Vol. IV., No. 2, p. 69 (1908).

† *Journ. of the S. African Ornith. Union*, Vol. VI., No. 1, p. 4 (1910).

‡ *The Ibis*, 1915, p. 537.

§ *The Ibis*, 1909, p. 155.

|| *The Ibis*, 1909, p. 507.

22nd (1913). The bird does not nest in the islands, but is plentiful in the first half of May, and numbers were seen throughout June, 1913! Are these part of the laggards from the south, and part of the sterile and non-breeding birds of this species? It is also worthy of note that Swallows should be more numerous there in spring than in autumn. Just the reverse would be expected if the birds had followed the same route on their journey south in the autumn as they had taken in their journey north in the spring.

It will be noticed that those birds nesting near the southern limit of the breeding area of this species, have actually arrived on their breeding grounds before there is any sign of a movement northwards amongst our Swallows in South Africa. It would therefore appear as if the Swallows nesting in the neighbourhood of the Mediterranean spend the end of, and beginning of, the year further north—that is, in the tropics.

I believe it was the late Henry Seebohm, a Yorkshireman, and a Past-President of the Yorkshire Naturalists' Union, who first propounded the theory that the birds of a migratory species which nest at the northern breeding limit of that species, are those which migrate to the southern limit of that species after nesting is over; also the birds which nest near the southern breeding area only migrate to the northern area of the so-called winter quarters, and those nesting in between those areas travel south in proportion. This theory has never actually been proved, but it has never been disproved, and much evidence has since accumulated towards supporting it. It certainly seems as if it were the case with the Swallow.

In 'A Monograph of the Swallows' (p. 222), Messrs. Sharpe and Wyatt say:—'In Tangiers, Mr. Favier states that it breeds, and in autumn numbers of migrants join the resident birds, and all depart for their winter home. The spring migration takes place in January and February, when great flights pass northward.' In the same work (p. 221), Colonel Irby observes:—'About Gibraltar the Swallow generally arrives about the 13th of February, although I have often seen a straggler in December and January. I have seen them crossing the Straits in considerable numbers up to the 15th of April; the latest I noticed were passing on the 24th of that month. I have observed the nest finished on the 23rd of February.' In the same work again (p. 221), Mr. Howard Saunders writes:—'I was informed that the usual date of the appearance of the Swallow at Malaga was the 25th of January; but I did not actually observe it till 4th February, 1868 (an exceptionally cold year).' In the same work Dr. R. B. Sharpe (pp. 221-2) says:—'Dr. Carvalho has furnished me with a table of observations respecting the Swallow as observed by him at Coimbra (a little south of Oporto) during

the last fifteen years, showing that the average date for arrival is the 10th February, and for departure the 13th October.' The late Howard Saunders, in his valuable 'Manual of British Birds' (1899, p. 164), says:—'To the extreme south of Europe the Swallow returns by the end of January, and below Seville I found many nestlings by April 16th.' W. H. F., writing in *The Field* of October 28th, 1916, in 'Notes from Salonika,' says:—'I saw a single Swallow on February 27th, and two days later, in the early morning, found every building in a small village covered with Swallows. They were nearly all asleep, and had, no doubt, just arrived.'

I now give some extracts from a paper by the late Dr. Otto Herman, whom I had the pleasure of hearing at the Fourth International Ornithological Congress, held in London in June, 1905, on the work done at the Hungarian Central Office of Ornithology, at Buda Pesth. He said* :—'In 1898 more than 5,900 masters of elementary schools, and other men also, decided to observe the arrival of the Chimney Swallow, and to report their observations to the Hungarian Central Office. These observers covered the area of Hungary very well. They sent in their data on special post-cards; the points of observation were geographically determined and then schematized, on particular maps, each day separately. In such a way we obtained 54 day maps, each with as many dots as there were points of observation. The result was:—Beginning of the migration, March 10th, 3 points; culmination, March 30th, 343 points; end, May 2nd, 15 points. Hereby the arrivals are seen to increase until March 30th, when they culminate, and then they decrease. We see, furthermore, that the arrivals fluctuated according to the state of the weather, that the settling of the Alpine region began only at the middle of April, that the plain, the hilly portion (Transdanubian district) and the Transylvanian plateau differ with respect to the time of migration, and that, therefore, Hungary may be divided into *four* migration areas. Furthermore, it was remarked that the settling did not take place on narrow routes of migration, also not on a broad front, but that it resembled the *scattering* of the seed by the sower, where many a seed might be flung this side of, and beyond the place for which it was intended. It was, moreover, proved that the mean day of arrival in Hungary, for the year 1898, was April 8th—since rectified to April 7th, on the basis of more than 10,000 data. From these series followed the settling maps, which show that the Swallow settles in Hungary in spring, coming from the south; the White Stork from south-east to

* *Proceedings of the Fourth International Ornithological Congress*, London, 1905, pp. 168 and 173.

north-west; the Wagtail from west to east; the Woodcock from south-west to north-east; the Cuckoo from south-east to north-west, etc. All positive facts which it would have been impossible to establish by the old method.'

'And if you ask me what we have determined by our method, I answer as follows: we know that the Swallow settles in the areas of Europe from Gibraltar to Luleå (in northern Sweden) in 105 days; that the young Swallows are already fledged in Gibraltar, when the old ones for Luleå only arrive; that the settling of Hungary may last as long as 70 days; that the Swallow remains here on an average 167 days.' Dr. Herman then advocates that their scheme should be undertaken on international lines. Dr. Herman compares the settling of the Swallows in the spring with 'the scattering of the seeds by the sower.' I always picture the advancing Swallows from the south of Europe to the north as resembling the incoming tide. Wave succeeds wave, and every now and then a larger wave will carry the waters much further than the average. Where the shore is level and shallow, the waves advance with much greater rapidity than where there are lesser or greater obstructions.

To quote 'A Monograph of the Swallows' again (p. 223), 'In southern Russia, according to Von Nordman, the Swallow appears as early as the 8th of April, and he considers that the time of arrival in south Russia is at least from 16 to 20 days in advance of their advent at St. Petersburg.' The Swallow nests almost all over Europe, and in Scandinavia, within the Arctic Circle; but not in Iceland. H. W. Wheelwright, 'An Old Bushman,' in 'A Spring and Summer in Lapland,' p. 281, writes:—'We had the Swallows, Common Martin, and the Bank Martin (at Quickiock, within the Arctic Circle) more common, I think, up here than even in Wermland' (in southern Sweden).

Let us now briefly consider the geographical position of the Common Swallow, say in the middle of April. The advance guard, and more particularly the early stragglers, are pouring into England; into Yorkshire, and even into Scotland. The rearguard, and particularly the laggards, have only just left South Africa, and are still present in the Transvaal and in Rhodesia. In north-west Africa and in south-west Europe the young are already hatched, and the birds that nest in northern Europe have not yet arrived and settled down! In the vast area north of the Transvaal to the northern limit of the areas mentioned, each day parties of Swallows are hurrying northwards, to reach the home where they were hatched. It may be asked how long it takes a Swallow to travel from South Africa to northern Europe. The only answer I can give is merely a guess; but for many years I have tried

to arrive at a fairly correct answer; based on the records of the departures of the Swallows from South Africa, and from their arrivals here I venture to say that it is about a calendar month, or very little more; which means that the birds must keep up an average speed of about 150 miles per day, during their vernal migration. Cape Town is 5,979 miles by steamer from Southampton.

I should not like to conclude a paper on bird-migration without a reference to Dr. Wm. Eagle Clarke, who is probably the greatest authority on this subject, past or present. He is a Yorkshireman, a Past President, Hon. Secretary, and at one time or other a holder of every official position in the Vertebrate Zoology Section of the Yorkshire Naturalists' Union, besides having been joint editor of *The Naturalist* and of the 'Vertebrate Fauna of Yorkshire.' I have learned much on bird migration from his writings, particularly from his two volumes on 'Studies in Bird Migration,' as all who are interested in this subject will have done.

In conclusion, I must express my thanks to the Hull Museum Authorities for providing a number of large maps to illustrate migration routes, etc., which I understand they had borrowed from the publishers of *The Naturalist*.

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Early nesting Robin.—A robin's nest with four eggs was found in an outhouse at the Union Workhouse, York. After the bird had sat for a week, the snowstorm of January 15th filled the nest and caused the robins to desert it.—SYDNEY H. SMITH, January 17th 1922.

Bittern in East Yorks.—A fine Bittern was caught alive on the troutstream between Driffield and Bridlington last week. It was in difficulties with a large trout, which it was endeavouring to swallow, when a carrier captured it and brought it to Bridlington, where it was kept alive in a stable. It is now in Mr. St. Quintin's Bird Refuge.—H. M. FOSTER, January 23rd, 1922.

Shag at York.—Further to my previous note (*Naturalist*, February, 1922), another shag, a mature female, has been obtained on January 11th, at York, being found on the River Ouse bank, close to the Guildhall in the City, and was choked by a large roach that was firmly fixed in the gullet. Another was killed at Pocklington about January 6th. All three birds are in the hands of Mr. Allen, the York taxidermist, and if any Yorkshire Museum would like one, I am in a position to pass one specimen along to it.*—SYDNEY H. SMITH, January 14th, 1922.

* Many thanks.—ED.

THE TRICHONISCIDAE (WOODLICE) OF THE SCARBOROUGH COAST.

RICHARD S. BAGNALL, F.R.S.E., F.L.S.

WHEN, on March 20th, 1912, I spent a brief hour or two collecting woodlice, etc., on the cliffs at Whitby, I was struck by the number of *Trichoniscidae* met with, my captures including both species of *Haplophthalmus* and two species of *Trichoniscoides*, *T. sarsi* being recorded from Whitby examples, for the first time as British.

Since my paper on *T. sarsi*, Mr. Rhodes has published a list (*The Naturalist*, 1916, p. 99-102 and 121-123) of Yorkshire Woodlice. I spent two or three days in the Scarborough neighbourhood during February of last year, when I made further records of these rarer forms. I did not meet with *T. rosus*, though it is recorded from Scarborough, and I am quite sure that it will be met with on the cliffs; on the Northumberland coast I have met this species commonly in large colonies in such situations. *T. pusillus* is ubiquitous.

Trichoniscus pusillus var. *violaceus* Schöbl. At the base of the cliffs north of Scarborough, February 21st, 1921.

T. pygmaeus G. O. Sars. Whitby, March 20th, 1912; not uncommon. Scarborough, February 21st, and Filey, February 22nd, 1921. I believe this species is common and widely distributed throughout the country.

Trichoniscoides sarsi Patience. Whitby, March 20th, 1912; Scarborough, February 21st; Cayton Bay, south of Scarborough and Filey, February 22nd, 1921. Mr. Rhodes did not add to my Whitby record, but I have since proved the species to be widely distributed, having found it, sometimes in colonies, in Northumberland, Durham, Westmorland, Lancashire, and on the South Coast at Torquay (Devon) and Bexhill (Sussex). It is a more fragile species than *albidus*, and of a distinctive golden-pink colour.

Trichoniscoides albidus B.-L. Whitby, March 20th, 1912 (also recorded by Dr. Brady from the Sheffield district). Two examples with *sarsi*, Cayton Bay, south of Scarborough, February 22nd, 1921.

Haplophthalmus mengii Zadd. Whitby, March 20th, 1912. Mr. Rhodes gives two further records. Scarborough, February 21st, 1921.

Haplophthalmus dancius B.-L. Whitby, March 20th, 1912. Previously known from Naburn Hall (T. R. R. Stebbing), and later recorded by Rhodes from Bradford. Filey, February 22nd, 1921.

In the Northumberland and Durham district, as well as in Furness and the Lake District, this species appears to be much scarcer than *mengii*, but further south it becomes the commoner species, sometimes occurring in large numbers.

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A Cartoonist Amongst Animals, by L. R. Brightwell. London: Hurst and Blackett, 100 pp., 3s. 6d. In this volume the well-known *Punch* artist has gathered together 175 of his humorous sketches, and a number of good stories. The artist finds human-like expressions on his subjects, whether mammal, bird, reptile or fish. It is just the book to help to pass the time on a tedious railway journey.

STATICE LIMONIUM ON THE NORTH BANK
OF THE HUMBER.

T. PETCH, B.A., B.Sc.

(Continued from page 12).

Attempts were made to identify these giant forms with some other species, but they proved to be undoubtedly *Statice Limonium*.

STATION C.—No *Statice* has been observed on the Cherry Cob Sands outstray. A similar outstray extends along the older part of Sunk Island from Stone Creek for a short distance eastwards. It is slightly higher than the Cherry Cob Sands outstray, and is flooded only at the highest spring tides. A few non-flowering plants of *Statice* were observed on this area in August, 1902.

STATION D.—This is the strip of saltmarsh left outside the bank at the last reclamation on Sunk Island. In 1902 it was nowhere more than ten yards wide, and ran along the foot of the bank for about a mile. It was then typical low-level estuarine saltmarsh, chiefly with *Aster Tripolium*, and a few normally-developed plants of *Statice Limonium* widely scattered over the whole length. They were similar to the plants from the next locality.

STATION E.—This is the small saltmarsh, lying to the east of the Patrington Haven Channel, in the angle between the Patrington and Welwick banks, open to the south, but protected on the west by the last enclosure on Sunk Island. It was described by Mr. T. Stainforth in *The Naturalist* for July, 1912. Its lower edge passes into bare mud flat which is submerged at almost every tide. A narrow strip along the foot of the embankment was covered with grass and *Juncus*, but nearly the whole of the area (in 1902) was low-level saltmarsh. A tide, 7 ft. 6 O.D. at Hull, just reached the outer edge in 1903. The area was estimated at two acres in August, 1902. Mr. Stainforth, writing in 1912, did not give the area at that time, but as he states that the marsh is only flooded at extremely high tides, it would appear that the level has risen considerably.

In August, 1902, over thirty clumps of *Statice Limonium* were counted, scattered over the whole area, but chiefly in the upper half. The plants were well grown and normally developed, with panicles up to 30 cm. high. The leaves varied from 10 to 18 cm. in length, and from 2 to 3.5 cm. in width; the tips were in nearly all cases terminal. The thickness of the leaf was 400 to 430 μ .

STATION F.—From Welwick to Easington no *Statice* was observed in 1902-04. Between Easington and Kilnsea there

was then a narrow strip of grass land outside the bank, terminating at a cliff, a few feet high, which descended vertically to the bare mud flat. This corresponded to the outstrays of Saltend and Cherry Cob Sands, but at its widest point it was not more than four or five yards broad. It was covered with grass, with some *Artemisia maritima*, and was submerged only at spring tides.

At several points along this grassy strip, sods had been cut to repair the bank, leaving small shallow pools. In 1902-04 *Statice Limonium* was growing in small quantity among the grass, near the edge of two of these pools. Both these were at about the same level, relative to the tides, as the Saltend locality.

Near one pool there was a large patch of *Statice*, of compact growth, with small leaves, but not flat on the ground. The plants did not flower during 1902-04. Their leaves varied from 5 to 7.5 cm. in length, and 1.5 to 2.2 cm. in breadth, the average length being 6.25 cm. and the average breadth 1.9 cm. The thickness of these leaves was 310 to 350 μ .

The other pool was bordered on the landward side by a narrow belt of *Artemisia maritima* and moderately long grass. The *Statice* grew in this belt in a patch about 2 feet long and 8 inches wide. These plants flowered in each of the years 1902-04. The leaves varied in length from 5.3 to 12.5 cm., and in breadth from 1.8 to 2.5 cm., the average length being 9 cm., and the average breadth 2 cm. The length of the leaves varied considerably on the individual plant, single leaves attaining a length of 12.5 cm. on a plant whose other leaves did not exceed 6.25 cm. The thickness of these leaves was 310 to 330 μ .

STATION G.—This was to some extent an inland locality. It was situated at Easington, immediately south of the road from the village to the Humber shore. Shortly before the beach is reached, the agricultural drain which runs along the road side turns southward, and after running parallel to the river bank for a short distance, enters the Humber through a clough and a tunnel, at right angles to the drain, beneath the intervening land. The area between the drain and the river bank (which, if my recollection is correct, is here a sand dune) appears to be reclaimed saltmarsh. Both in 1903 and 1904, part of the roof of the tunnel had fallen in, and, consequently, the tidal water flooded part of this area at high spring tides. Two patches of *Statice* occurred on this area in 1903-04. Each was about two feet in diameter, and consisted of a compact growth of small plants without any mixture of other vegetation. One of them was at a slightly higher level than the other. Both flowered in 1903, but only the lower in 1904. The inflorescences were from 6.6 to

11 cm. high, compact, with numerous flowers. The leaves varied from 2.5 to 5.3 cm. in length, and from 0.8 to 1.6 cm. breadth. The average length was 4.6 cm. and the average breadth 1 cm. The thickness of the leaves was 310-350 μ . In both these patches the leaves were sub-erect, and the plants formed a dense shrubby growth, quite unlike the dwarf plants at Saltend.

The following table summarises the data for 1902-04 :—

<i>Locality.</i>	<i>Length of leaf.</i>	<i>Breadth of leaf.</i>	<i>Thickness.*</i>	<i>Height of inflorescence.</i>
A. Saltend	2.4-5 cm.	0.7-1.5 cm.	320-330 μ	no flowers
B. Hedon Haven	up to 43 cm.	up to 9 cm.	440-480 μ	up to 47.5 cm.
C. Stone Creek	not measured			
D. Sunk Island	not measured			
E. Welwick	10-18 cm.	2.3.5 cm.	400-430 μ	up to 30 cm.
F. Easington—				
Kilnsea (1)	5-7.5 cm.	1.5-2.2 cm.	310-350 μ	no flowers
Easington—				
Kilnsea (2)	5.3-12.5 cm.	1.8-2.5 cm.	310-330 μ	not measured
G. Easington	2.5-5.3 cm.	0.8-1.6 cm.	310-350 μ	6.6-11 cm.

In May, 1904, plants of *Statice* were transplanted from the Saltend outstray to the edge of the adjacent strip of saltmarsh, at the level at which *Aster Tripolium* began to grow. Sods about six inches in diameter were cut out and embedded in the mud, being fixed by a stake, 2 ft. 6 in. long, driven through the sod into the mud. Other plants from the same locality were transferred to a garden at Hedon.

In August of the same year the plants in the mud were still alive, but their new leaves were no bigger than before. Only one plant survived in the garden: its new leaves were not glaucous, and were slightly larger and thinner. One leaf was 7.8 cm. long, and the average of four leaves was 6.8 cm. The thickness of these leaves was 205-250 μ . Wishing to have *Statice* growing in an inland locality, I visited the gardens of a nurseryman who advertised *Statice Limonium* for sale, but found that none of his stock was this species.

At the beginning of 1905 I left England. In August, 1911, I was able to re-visit some of these localities. Locality 'A' was in the same condition as in 1904, but the *Statice* leaves were smaller. I was unable to find any trace of the plants transplanted to the mud. The Humber 'house boats,' evicted from the Marfleet creek by dock extensions, had taken refuge in Hedon Haven, and the sites of the transplanted *Statice* were buried beneath cinder paths across the mud, and the usual débris of discarded marine stores. In locality 'B,' however, *Statice* still flourished. At that point a further change had occurred, with the result that the bank sloped gradually

* The thickness was measured at the broadest part of the leaf, midway between the midrib and the margin.

into the normal fringe of saltmarsh; the plants at this station were now of normal size, the largest leaf seen measuring 17 cm. in length and 4.4 cm. in breadth.

In August, 1920, I visited Saltend again, and found the locality completely changed. Up to 1911 the adjacent common had been grazed, and the animals wandered over the bank on to the outstray. About 1915 (as far as I can ascertain), the common was made the site of the Hull oil fuel installations, and when the building of the tanks began, grazing ceased. In 1920, the former close-shaven flat was covered with tangled grass, mixed with *Aster Tripolium*, *Armeria maritima*, *Plantago maritima*, and *Triglochin maritimum*. Most of the *Statice* had been obliterated, but the plants which had survived were normal, with leaves up to 25 cm. long, and 5.5 cm. broad.

Thus the natural changes had thrown light on two points. The plants in locality 'B' had become normal by their transference through slips further from the base of the bank; their former large size was probably due to the fact that they grew up among the long grass on the bank. Again, in locality 'A,' the cessation of grazing had converted that area into high-level saltmarsh, and the *Statice* had become normal; its former nanism was due to the grazing, though indirectly, as the plants were not eaten. It appears to have been merely the effect of the shortness of the surrounding herbage.

That *Statice*, on these high-level flats, will grow up and flower, if surrounded by moderately tall herbage, but remain dwarf and flowerless if among short herbage, is illustrated by the two sets of plants on the cliff between Easington and Kilnsea. The plants of station 'G,' at Easington, form an exception, as they are dwarf, but flower: the conditions of submersion of these tufts are not, as far as I could discover, markedly different from those of the plants in station F.

On the dwarf forms of *Statice Limonium* the leaf is usually margined by a conspicuous hyaline border. This consists of the extended cuticle of the upper and lower epidermis. On the larger leaves, it is still present, but is not so conspicuous, as its breadth does not increase in proportion to the size of the leaf.

The variation in the tip of the leaf has already been alluded to. Small leaves are acute, with a terminal tip. On the larger leaves the prolongation of the mid-rib forms an appendage or flagellum, arising from the back of the leaf, a short distance below the apex. The apex of the leaf in such cases may be hooded, or incised and channelled. In some specimens collected at Burnham-on-Crouch, the appendage was buttressed, *i.e.*, united to the leaf for a short distance by a wedge of tissue.

(To be continued).

PALÆOLITHIC MAN.

THE past few years have witnessed the appearance of quite a library of books dealing with Pre-historic Man, but we give the credit to Professor R. A. S. Macalister* for having produced the most fascinating and clearly written volume on the subject, which is sound scientifically and full of appropriate humour ; a rare feature in works of this sort.

Prof. Macalister, by means of his various lectures on Pre-historic Man given to the University College, Dublin, and by a careful search through the voluminous literature, has now presented a well-reasoned review of the various evidences of earliest man, which is particularly pleasing to the present writer, as, probably quite unwittingly, the Professor backs up various criticisms which have appeared in this journal relating to several remarkable 'discoveries.'

Just now there is quite a revival in interest relating to early man, due to numerous finds, actual and assumed, which are being made, and at the forthcoming meeting of the British Association at Hull, at least two important discussions are to take place ; one on the relationship of various human remains to phases of the Ice Age in Britain, and another on the remarkable primitive skull recently found in Rhodesia. In view of these discussions we propose to refer to some of the conclusions arrived at by Professor Macalister, and hope that those intending to be present at the Hull meeting will take an opportunity of studying his 'Text-book of European Archæology.'

The author begins by a chapter on geology, a knowledge of which is absolutely essential to anyone dealing with pre-historic remains ; yet a science too often neglected by our 'authorities' on 'prehistory.'

Of the now notorious 'rostro-carinates' described by Sir E. Ray Lankester to the Royal Society, it is stated 'Now we learn the astonishing fact that more or less contemporary with the Kentian "Pliocene Man," who was chipping his trumpery scrapers, there was living in the neighbourhood of the site of Ipswich a being who had attained to the art of making tools of a considerable degree of complexity. These are the so-called *eagle-beak* or *rostro-carinate* flints. Quite a luxuriant crop of literature has sprung into existence about these flints, during the few years that have elapsed since they were first published. To this type of flint, or to the supposed industry which it represents, has been given the name *Icenian*—not a pedantically scientific term, as it is derived from the name of Celtic tribe which inhabited the district some hundreds

* A Text-book of European Archæology. Vol. I.—The Palæolithic Period. Cambridge University Press, 610 pp., 50s. net.

of thousands of years after the alleged time of the implements.' And, 'Sir E. Ray Lankester in the course of his paper more than once expresses his regret that he cannot imagine what end the tools served; though in his "Summary of Conclusions" he suggests that they were "not improbably used for dressing and smoothing the skins of animals." This hardly explains their peculiar form. Similar objects have been found by Prof. Sollas at Selsey Bill in Sussex; he does not, however, claim for them a human origin, but regards them as being due to natural causes, also operative in the Suffolk deposits.'

Of these flints we are informed that 'Self-deception is a perfectly innocent misfortune, to which archæologists are peculiarly liable. M. Marcellin Boule, who has reviewed the whole subject in a trenchant article, has personally examined the strata in the neighbourhood of Ipswich in which the rostro-carinate flints were found. He points out that these strata contained a vast mass of broken flints to which no archæological value can be attached: and that the rostro-carinates are simply one series of such accidental fragments. He further shows that the stratum is a marine deposit, so that (like the Eocene flint-chippers of Mons) the makers of the rostro-carinate tools must have been at least amphibious, if not actually mermen. And, as we have already seen, even those who are responsible for bringing forward these objects, while claiming that they are "highly specialised," are unable to suggest any probable use which would require so high a degree of specialisation. After this it would be unprofitable to pursue the subject further.'

After carefully reviewing the evidence in favour of Eoliths being the work of man, Prof. Macalister says that 'The conclusion to which we are led by this discussion is that *No theories about Tertiary man, or precursors of man, in Europe, can be based on the objects called Eoliths*: because

- (1) They are found only in flint-bearing regions, which indicates that they are produced by natural causes of some kind to which flint responds more readily than other stones.
- (2) There is no test whereby they can be distinguished so clearly as to command universal acceptance, from naturally broken pebbles.
- (3) There is no probability that the requirements of Tertiary man, or precursors of man, were so complex as to call for the use of tools at all.
- (4) Even if they were, the flints called eoliths would not serve any such purposes.
- (5) There are many alleged eoliths for which no conceivable use of any sort can be suggested.

On these grounds we reject the Pliocene eoliths, and *a fortiori* those of earlier eras. It follows that if we deny the existence in Europe during the Tertiary times of a being

capable of making and using even such feeble attempts at flint tools as the average eolith, we must still more strongly deny the existence of a manufacturer of the more complicated rostro-carinates.'

This conclusion reminds us of the statement made by Prof. Sollas, 'Eolithic scrapers that will not scrape, borers that will not bore, and planes that will not plane.'

The Dewlish Elephant trap, once thought to be evidence of Tertiary man, but now known to be a perfectly natural feature, is disposed of quickly.

The alleged ancient carving of a human face on a shell (see *Naturalist* 1914, p. 414) is thus dismissed;—'Scarcely worth so much as a mention, except as an example of Archæology *pour rire*, is the human face depicted upon a scallop-shell (*Pectunculus glycymeris*), alleged to have been found in the Red Crag of Walton-on-the-Naze, Essex, and supposed to prove that Pliocene man not only existed, but was able to make portraits of himself and his friends. Not the least amusing part of the story are the circumstances of the discovery of this object, by a young man who was an enthusiastic atheist, and who rejoiced in adding one more to the "mistakes of Moses." But later, becoming converted, he wished to prove the honesty of his new convictions by destroying this anti-religious piece of evidence. He was prevented from doing so, however, by a well-known collector, who secured the prize. A mere glance at the object is enough to condemn it as a preposterous forgery. An admirable illustration of this precious work of art, accompanied by an unduly solemn report, will be found in the *Proceedings of the Prehistoric Society of East Anglia*, Vol. I. (1913), plate LXXIII. p. 323 ff.'

After very careful consideration the author considers that 'no success had crowned the search for Tertiary man in Europe, or even for Tertiary precursors of man. No bones of such a being have come to light, and while eoliths can be reasonably explained as natural products, they are inexplicable if they are to be regarded as artificial.'

'And now Prof. Klaatsch comes on the scene, and tells us that "One can without difficulty classify the majority of Mesvinian implements into a number of categories, hammer-stones, scrapers, hollow-scrapers, borers, knives, etc. Rutot has in his numerous works delineated the full variety of these instruments in sharp and characteristic line drawings, which are far better than the wash-illustrations of English authors." So as not to fall under this condemnation, we borrow Prof. Klaatsch's own photograph of Mesvinian eoliths collected by himself. Beside it, we set a similar plate of photographs of chips of flint collected at random from a garden walk. Doubtless someone will say that these, too, are implements: I

prefer to regard them as the products of the garden roller. The reader is free to form his own conclusions.'

The author's review of the Piltdown remains is excellent ; he does not incline to the idea put forward by some writers (who have not even seen the specimens) that the skull is human and the jaw that of a chimpanzee.

Two human skeletons which have figured prominently in archaeological literature in recent years are somewhat summarily dealt with :—' The Galley Hill skeleton is one of the trump cards in the hands of those who hold that the modern type of man developed at an early stage of the history of humanity in Europe ; the doubt that must always cling to it is therefore unfortunate. Its condition of fossilisation was less advanced than that of other bones deposited in the same stratum ; and Duckworth has shewn reason for believing that it is merely an Anglo-Saxon interment. The skeleton belonged to a man entirely modern in type and rather short in stature. *Ipswich*. The skeleton found at the end of 1911, embedded in the Red Crag at Ipswich, created much sensation at the time, but the discoverer has himself withdrawn it from the field of science, acknowledging the faultiness of the original observations. Nothing need further be said of it.'

Respecting a recent discovery of alleged Palæolithic pottery with human remains in a dry valley at Ipswich, the author states ' These people, so far as the fragmentary conditions of their remains permitted a judgment to be formed, were of modern type, and therefore not Mousterian ; and of low stature, therefore not Aurignacian. Marks on some of them explained as tooth-marks, once more revived the question of cannibalism ; but man does not gnaw bones, neither will his teeth make such marks. The fauna was entirely holocene in character, excepting one bone, doubtfully identified as part of the tibia of a mammoth ; and the flora, of which remains were to be found in the peat-bed, was also exclusively of recent species, and indicated a modern climate, such as did not prevail during the Mousterian stage. The inference is inevitable that there is a faulty observation somewhere. It may be that the potsherders have in some way worked through the soft peat to the place where they were found. Or it may be that in spite of their Mousterian and Aurignacian facies, the flints are Neolithic. A button of coprolite, with a scratched ornament upon it—such as is not found in Mousterian strata—agrees with this ; and the cautious judgment of the expert geologist whose opinion was invited is fully justified. He says " If one were to ask oneself the question as to whether one would be surprised if it were proved on other grounds that the floors were of Neolithic date, one must frankly confess the answer would be No." '

On the question of the age of Cissbury, etc., we learn ' In

recent years attempts have been made to put the pits at Cissbury, and the flint-mines known as "Grime's Graves" at Brandon, Suffolk, back into the Palæolithic epoch. I must acknowledge myself unable to share these views; for me, these sites, with their modern fauna, are Neolithic.'

Unfortunately the book was too far advanced before the account appeared of a figure of an elk with red-deer antlers, etc., scratched on the outer surfaces of flint nodules, found in the Grime's Graves (see *The Naturalist*, 1921, p. 257). We should have liked the author's verdict upon these.

Still referring to engravings of animals, it is reported that 'As remote specimens of animal engraving, indicating the geographical limits of the art, may be mentioned the examples which England has yielded. These are a representation of a horse-head from Robin Hood's Cave (Cresswell Crags), and a similar but less definite example from Sherbourne. An engraved figure of a goat (?) standing with one leg raised, faintly inscribed on a pebble found at Nayland, Suffolk, is perhaps a little doubtful; it seems somehow to lack the indefinable but unmistakable "feeling" of Magdalenian Art.' In place of this 'perhaps a little doubtful,' we should, after having examined the specimen, certainly state 'a purely natural feature,' caused by a flake being broken from a quartzite pebble, probably by a plough. The drawing on the pebble as reproduced in Prof. Macalister's volume, taken from the *Proceedings of the Suffolk Institute of Archæology*, has evidently been filled in with chalk and imagination, and is much 'improved' upon the figure on the stone itself.

But the next sentence makes one gasp, 'We need say nothing of the "mammoth" from Saxmundham, Suffolk' (see *Naturalist*, 1919, pp. 85-86, 126-128). Thus is dismissed Mr. Reid Moir's epoch-making discovery of a 'statue' of a mammoth, a memoir upon which appeared in *Man*, and a further memoir upon which was threatened; but we fancy the threat will never be carried out.

And lastly, Prof. Macalister deals with the 'Supposed Glacial Striae on Neolithic Flints,' a subject we have from time to time discussed, and of these he says 'What are we to say of one glaciation, let alone five or six, which passed over the country and left no traces whatever except scratches on artificial implements? *How did the ice choose on which side to make the scratches?* For we are told, in the East Anglian Society's *Proceedings*, that the scratches are almost always on the bulbar side of the flake. How could such an ice-flow produce criss-cross scratches on a small flake? These are some of the questions which present themselves when we examine the illustrations: and we feel constrained to conclude that almost any theory of the origin of these markings is better than

the glacial theory! They might even have been made artificially as ownership marks, or, more probably, to roughen them and so to facilitate firm grasping.'

Yes! this text-book is distinctly healthy. The author has resisted the temptation to which so many students of Pre-historic remains succumb; he does not desire to make everything he touches appear to be older than anything else known. He has pulled down the temples containing the cherished clay-footed idols of this new cult; we are beginning to see the light of day—our vision is no longer impaired.—T.S.

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Ocean Research and the Great Fisheries, by G. C. L. Howell. Oxford: Clarendon Press, 220 pp., 18s. net. This is precisely the book wanted by those interested in the fishing industry who require scientific information in an agreeable and understandable form. We like it—albeit the author considers that 'What is good in the book is the work of other people. The mistakes are my own.' He has an interesting chapter on oceanic research, and then follows with details of the Plaice, Turbot, Sole, Haddock, Cod, Halibut, Hake, Skate and other of our principal food fisheries. We are glad to see that he gives proper prominence to Prof. Garstang's researches in connexion with the transplantation of Plaice, and points out that after an unnecessary lapse of years the Government is at last realising the value of Garstang's work, and steps are now being taken to profit by it. There are several well-chosen illustrations and maps, and a large chart at the end of the volume. Those who delight in statistics will also find food for thought in the book.

A Catalogue of British Scientific and Technical Books, covering every Branch of Science and Technology carefully classified and Indexed, prepared by **A Committee of the British Science Guild**. British Science Guild: 6 John Street, Adelphi, London, 376 pp., 10s. This volume has been compiled by a strong Committee formed by the British Science Guild, and may safely be taken as a reliable list made without bias. There are about fifty general headings to scientific subjects, each being split up into sub-sections—sometimes as many as twenty or thirty to each heading. On carefully perusing the items under those subjects with which we are more familiar, the number of volumes quoted is usually fewer than we should have thought, possibly due to the limitations of space; in some cases names appear which we little dreamt would have been included in such a process of selection; other expected ones are omitted, though sometimes, not always, in the latter case, possibly because the books are out of print, as only volumes now available are included. Under Natural History, Darwin is responsible for one entry, W. P. Westell one, and Ray Lankester four; under Nature Study neither name appears! Under 'Flora,' besides several general volumes, the Floras of Berkshire, Hampshire and Bristol, represent local floras, though why these three only it is difficult to understand. Similarly, under 'Topographical Geology,' are local notes referring to Aberystwyth, London, the Lake District and Cambridgeshire: not a word about the Geological Survey Memoirs, nor is the Survey mentioned under Economic Geology, Palæontology, nor even under 'Geological Maps.' However, these are small items in a catalogue of over 6000 titles, and as it is hoped to issue the volume annually, any suggestions will doubtless be welcomed by the Committee. The volume should prevent the hopeless lists of scientific books, hitherto found in some public libraries.

KEY TO THE HARPIDIROID HYPNA.

J. A. WHELDON.

(Continued from page 16).

- LIMPRICHTIA Loeske. 'Drepanocl. eine biolog. Mischgattung' in Hedwigia, XLVI., 310.
3. *L. latinerve* (Warnst. 'Die europ. Harpidien' in Bot. Centralb., 1903, 416) Wheldon.
 4. *L. vernicosa* (Lindb. Hartm. Skand. Fl., 1861, 17) Loeske *loc. cit.*, 310; Braithw., 45; Dixon, 522.
var. *majus* (Lindb. *loc. cit.*) Dixon, 523.
var. *turgida* (Jur.).
 5. *L. pellucida* (Wils. MS.) Wheld. (M.E.C. Report, 1909, p. 316).
 6. *L. intermedia* (Lindb. Hartm. Skand. Flor., 1864, 17) Loeske *loc. cit.* 310; Braithw., 42; Dixon, 524.
f. *vera* (Sanio. Bot. Centralb. XIII., 13).
f. *falcata* (Sanio. *loc. cit.*).
f. *purpurea* (Sanio. *loc. cit.*).
f. *nigrescens* (Sanio. *loc. cit.*).
var. *Cossoni* (Schimp. Bry. Eur. Suppl., 1866).
f. *falcata* (Sanio. em. Wheld. in 'N. Engl. Harpid.' *The Naturalist*, 1902, 89).
 7. *L. revolvens* (Swartz Musc. Suec., 1799) Loeske. *loc. cit.* 310; Braithw., 43; Dixon, 523.
f. *typica* (Ren. Musc. Gallic. Sect. Harpid., 1894, 391).
f. *flavescens* Wheldon. f. nov.
- SANIONIA (Loeske 'Drepanocl. etc.' in Hedwigia XLVI., p. 309. Emend. Wheldon).
8. *S. uncinata* (Hedw. Musc. frond. IV., 1797, 65) Loeske *loc. cit.*; Braithw., 46; Dixon, 521.
var. *sueta* (Sanio pp. 'Addit. Harpid. cogn.' in Bot. Centralbl. XIII.) Wheldon.
f. *plumosa* (Schimp., Syn. Ed. I., 1860).
var. *abbreviata* (Schimp. Bry. Eur., 1854).
var. *alpina* (Ren. in Musc. Gallic. Sect. Harpid., 1894, 379).
var. *plumulosa* (B. & S. Bry. Eur., 1854). Dixon, 522.
var. *contigua* (Nees Mscr. Hüben. Muscol. germ., 1833, 676).
 9. *S. symmetrica* (Ren. et Card. Bot. Gaz., XIV., 99) Wheldon.
 10. *S. orthotheციoides* (Lindb. in Hartm. Skand. Flor., p. 33) Loeske *loc. cit.*
f. *orthophylla* Wheldon f. nov.
f. *subfalcata* Wheldon f. nov.
- CRATONEURON C.M.
11. *C. glaucum* (Lamarck. Fl. France, i., 1778, 522). Braithw., 36; Dixon, 525.
subsp. *C. commutatum* (Hedw. Musc. frond. IV., 1797, 68) Roth. Braithw., 36.
var. *fontanum* Wheldon f. nov.
var. *subirrigatum* Wheldon f. nov.
subsp. *C. decipiens* (De Not. Epil. 1869, 233) Wheldon. Braithw., 38; Dixon, 427.
subsp. *C. gracilentum* Wheldon subsp. nov.
subsp. *C. sulcatum* (Schimp. Synops., 699) Wheldon. Braithw., 37; Dixon, 527.

- subsp. *C. gracilescens* (Schimp. Synops., 743) Wheldon. Braithw., 40; Dixon, 526.
- subsp. *C. falcatum* (Brid. Musc. rec., 1801, 63) Wheldon. Braithw., 39; Dixon, 525.
- var. *delicatulum* (Dixon. Journ. Bot.).
- var. *dunale* Wheldon var. nov.
- var. *speciosum* Wheldon var. nov.
- var. *alpinum* Wheldon var. nov.).
- subsp. *C. irrigatum* (Zett. Musc. Pyren. in Sv. Akad. Handl., 1865, 48) Wheldon. Braithw., 40; Dixon, 526.
- DREPANOCLADUS (C. Mull. Syn. Musc. frond. ii., 1851, 321) Warnst. 'Die europ. Harpidien.' in Bot. Centralbl. XIII., 1903, 397. Emend. Loeske in Hedwigia XLVI., p. 311.
12. *D. brevifolius* (Lindb. Spitzb. Mossor, 1866, 541) Warnst. *loc. cit.*, 416.
13. *D. latifolius* (Lindb. et Arnell Musc. Asiæ bor. II., 1890, 120) Warnst. *loc. cit.* 415.
14. *D. capillifolius* Warnst. Bot. Zeitung, 1877, 478. Dixon, 510.
- var. *falcatus* Warnst. Bot. Centralbl. XIII., 412.
- var. *squarrosus* Warnst. *loc. cit.*
- var. *laxifolius* Warnst. *loc. cit.*
- var. *angustifolius* Warnst. *loc. cit.*
- var. *gracilescens* Warnst. *loc. cit.*
15. *D. Barbeyi* (Ren. et Card. Bull. Herb. Boiss. II., 1894) Wheldon.
16. *D. Flageyi* (Ren. Musc. Gallic. Sect. Harpid. 1894, 395) Wheldon.
17. *D. lycopodioides* (Brid. Sp. Musc. II., 1812, 227. Emend. Schwgr. Suppl. 1816, 300) Warnst. *loc. cit.* Braithw., 44; Dixon, 516.
- f. *proliferus* Wheldon f. nov.
- f. *obesus* Warnst.
- f. *attenuata* (Wheldon. Proc. Liverpool Bot. Soc., 1908, pub. 1910, p. 21).
- var. *americanus* (Ren. Musc. Gallic. Sect. Harpid. 1894, 376) Wheldon.
- var. *julaceus* Sanio.
18. *D. Wilsoni* (Schimp. Bry. Eur. Suppl. 3-4, t. 3) Roth. Braithw., 41; Dixon, 516.
- var. *hamatus* (Ren. *loc. cit.* 376) Roth. Braithw., 42; Dixon, 516.
19. *D. Sendtneri* (Schimp. Bry. Eur. Suppl. 3-4, 1866) Warnst. Braithw., 40; Dixon, 515.
- f. *late-auriculata* (Ren.).
- f. *tenuis* Wheldon. f. nov.
- f. *vulgaris* (Sanio. 'Comment. Harpid. europ.' in Bot. Central. 1880, p. 15).
- f. *trivialis* (Sanio. *loc. cit.* 18). Dixon, 516.
- var. *gracilescens* (Sanio. *loc. cit.* 14). Dixon, 516.
- var. *giganteum* Schimp. Synops. Ed. I.
20. *D. asturicus* (Ren. Musc. Gallic. Sect. Harpid. 372) Wheldon.
21. *D. aduncus* Hedw. (subsp. *typicum* Ren. Musc. Gallic. Sect. Harpid., p. 369) Roth. (non *Drep. aduncus* (Hedw.) Warnst.). Dixon, 512.
- f. *laevis* (Boul. Musc. Fr. 60) Roth. Dixon, 513.
- f. *turficola* (Ren. Musc. Gallic. 369).
- var. *filiforme* (Berggren. 'Beschreibung der Harpid.' p. 33).
- var. *gracilescens* (Schimp. Synops. Ed. II.) Wheldon. Dixon 513. (= *Drep. subaduncus* Warnst. Die europ. Harpid. 422).
- f. *fastigiata* (Ren. Rev. Bryol. 1910, 32).
- f. *tenuis* (Schimp. Bry. Eur.).

- var. *falcatus* (Ren. Musc. Gallic. Sect. Harpid. 1894, 369).
 Dixon, 513.
 f. *littoralis* Ren., Revue Bryol. 1910, 30.
 f. *subpiligera* Ren. loc. cit.
 f. *rufoalavis* Ren. loc. cit. p. 31.
 var. *Wheldoni* Ren. loc. cit. 29.
 var. *pseudo-Sendtneri* (Ren. et Langeron. 'Les Mous. Social. du
 Palat.' in Bullet. Soc. Bot. Fr. 1903, 439).
 var. *cystopteron* Ren. Rev. Bryol. 31.
22. *D. polycarpus* (Bland. in Sturm. Deutschl. Fl. II. 1813) Warnst.
 'Die europ. Harpid.', p. 399. Braithw., 50; Dixon,
 513.
 f. *acanthoclada* (Moenk. (4) p. 38).
 var. *attenuatus* (Boul. Musc. Fr., p. 61). Dixon, 513.
 var. *pungens* (H. Müll. in Milde Bryol. Siles., 351). Dixon, 514.
 var. *clavatus* (Ruthe).
 var. *peracuminatus* (Paris. Index Bryol. Suppl. I., 1900, p. 193).
 (= *Hypnum aduncum* (Kneiffii) var. *Rollii* Ren. (7)).
 var. *immersus* (Warnst. 'Die europ. Harpid.' p. 408).
 (= *Drepanocladus simplicissimus* var. *immersus* Warnst. (6)).
 var. *intermedius* (Schimp. Synops. Ed. II., 727). Braithw., 53;
 Dixon, 514.
 f. *penna* Sanio (Beschr. der Harpid., 1885).
 f. *inundata* Wheldon.
 f. *laxa* (Schimp. in Milde Bryol. Siles., 351).
 f. *laxifolia* (Sanio. 'Comment. Harp. europ.' in Bot. Central.
 II., 1880). Dixon, 514.
 f. *Camusi* (Ren. Rev. Bryol. 1910, 33).
23. *D. pseudofluitans* (Sanio in Hedwigia., 1887, 158) Warnst. 'Die
 europ. Harp.', 405. Dixon, 514.
 subsp. *paternus* (Sanio. 'Comment. Harp. europ.', 1880, p. 8).
 Braithw., 53; Dixon, 514.
 f. *flagelliformis* (Roth. et von Beck. Übersicht u. europ.
 Drepanocl. in Hedwigia XLVIII., 164).
 f. *perpinnatus* (Ren. MS. ex. Wheldon. 'N. Eng. Harpid.',
 p. 72).
 (= var. *filicis* Roth. 'Übersicht, etc.' in Hedwigia XVIII., 164)?
 f. *acanthoclada* (Mönkemeyer in Hb. Wheld. vide 'Sitzung-
 verichten der Naturforsch. Ges. zu Leipzig,' 1906,
 p. 9).
 f. *gracilis* (Ren. in Wheld. 'N. of Eng. Harpid.' *The
 Naturalist*, 1902, p. 72). Dixon, 514.
 var. *flexilis* (Ren. Musc. Gallic. Sect. Harpid. 1894, p. 373).
 subsp. *aquaticus* (Sanio. Comment. Harp. europ. 1880, p. 7).
 Dixon, 513.
 f. *dunense* Wheldon f. nov.
 f. *tenuis* (Roth. et von Beck. 'Übersicht u. europ. Harpid.'
 loc. cit. 163).
 f. *fluitans* (Warnst. vide Roth. 'Übersicht, etc.' loc. cit. 163).
 var. *occidentalis* (Ren. et Card. Musc. Gallic. Sect. Harp., 394).
- WARNSTORFIA (Loeske, 'Drepanocl., etc.' in Hedwigia, XLVI., p. 310).
24. *W. fluitans* (Dillen. Hist. 1741, 546; Linn Fl. suec. ed. 2, 1752, 399)
 Loeske loc. cit. 310. Braithw., 49; Dixon, 517.
 Section (a) *paludosa*—
 var. *Jeanbernati* (Ren. Rev. Harpid. in Rev. Bryol. 1879).
 Braithw., 50; Dixon, 518).
 f. *tenella* (Ren. 'Class. Harpid.' in Revue Bryol., 1881).

- f. *elata* (Ren. et Arnell) Musc. Gallic. Sect. Harpid., 1894, p. 381.
 var. *gracile* (Boul. Musc. Fr., 63). Dixon, 518.
 f. *abbreviata* (Ren. in Wheld. 'N. Eng. Harpid.' *The Naturalist*, 1902, p. 79).
 f. *laxifolia* (Ren. in Wheld. 'N. Eng. Harpid.' *loc. cit.* 79).
 var. *Payoti* (Ren. Musc. Gallic. Sect. Harpid., 1894, 381).
 var. *Robertsiae* (Ren. et Dixon, Journ. Bot., 1901, 277). Dixon, 518.
 var. *squalidum* (Ren. et Dixon, *loc. cit.*). Dixon, 518.
 var. *setiforme* (Ren. Musc. Gallic. Sect. Harpid., 1894, 382). Dixon, 518.
 var. *pseudostraminea* (C. Müll. *vide* Sanio, 'Bryol. Fragm. II.' Hedwigia, 1887, 129).
 var. *submersa* (Schimp. Synops. Ed. I., 609).
 var. *scotica* Wheldon var. nov.
 var. *atlantica* (Ren., Journ. Bot., 1901, 278). Dixon, 518.
 f. *gracilis* (Ren. *loc. cit.*), more slender, l. smaller, nerve slightly narrower.
 f. *elongata* (Ren. MS.), submersed (10-15 cm. long), leaves longer and more distant, erect patent.
 [f. *brachythecioides* Wheldon, M.E.C. Report, 1907, p. 255. Habit of *Brachythecium*, leaves erect patent, ovate shortly acuminate, areolation lax, auricles small and indistinct. St. Ishmaels, Pembroke.]
- Sect. (b) *falcata*—
 var. *Delamarei* (Ren. et Card. Musc. Gallic. Sect. Harpid., 1894, 384).
 var. *Arnellii* (Sanio, 'Beschreib. der Harpid.', p. 15). Dixon, 519.
 var. *procera* (Ren. et Arnell Musc. Gallic. Sect. Harpid., 383).
 var. *tricolor* (Sanio, 'Bryol. Fragm. II.' in Hedwigia, 1887).
 var. *falcata* (Schimp. Synops. I., 609). Braithw., 50; Dixon, 519.
 f. *alpina* (Schimp. Synops. I., 609).
 f. *shetlandica* (Ren. ined.).
 f. *submersa* (Mönkem.).
 var. *ovale* (Ren. ex Wheldon, Journ. Bot., 1901, 299, *vide The Naturalist*, 1902, p. 81).
 f. *densum* Wheldon f. nov.
 var. *anglicum* (Sanio Hedwigia, 1887, 143). Dixon, 519.
25. *W. exannulata* (Gümbel Bry. Eur. 57-61, 1854, 34) Loeske *loc. cit.* 310. Braithw., 47; Dixon, 520.
 var. *pinnata* (Boul. Musc. Fr., 62). Dixon, 520.
 f. *acuta* (Sanio, 'Beschreib. der Harpid.' 12). Braithw., 48.
 f. *gracilescens* (Ren. Musc. Gallic. Sect. Harpid., 1894, 385).
 f. *versicolor* Wheldon f. nov.
 f. *montana* (Ren. in Wheldon's 'N. Eng. Harpid.' *The Naturalist*, 1902, 84).
 f. *polyclada* (Ren. in Wheldon's 'N. Eng. Harpid.' *loc. cit.*).
 var. *robustus* (Roth. et von Bock., 'Übersicht v. europ. Drep.', in Hedwigia XLVIII., 153).
 var. *lapponicus* (Roth. MS.) ined.? More slender than the preceding, very densely branched, the branches curved, pungent and glossy. Nerve twice as stout. Leaves denticulate all round. Abisko, Tornean Lapland. Dixon (11) and Nicholson.
 var. *tundrae* ((Arn.) Jörg. in Christ. Vid. Salsk. Förh, 1894, No. 8) Loeske *loc. cit.*

- var. *brachydictyon* (Ren. Musc. Gallic. Sect. Harpid., 1894, 385.)
Braithw., 49; Dixon, 520.
- var. *Nicholsoni* (Ren. ex Dixon et Nicholson, 12). Dixon, 521
(as f. *orthophylla* Ren.).
- var. *stenophylloides* (Ren. in Wheldon's 'N. of Eng. Harpid.,
1902, 83). Dixon, 520.
- (= *D. exannulatus* var. *submersus* Roth. et von Bock.
f. *acanthocladus* (Roth. et von Bock. *pro* var. 'Ubersicht, etc.,'
loc. cit. 168).
26. *W. serrata* (Lindb. in Hedwigia, 1867) Wheldon.
var. *Mildei* (Ren. Rev. Bryol. vi., 1909, 130) Wheldon.
27. *W. stenophylla* (Wils. Musc. Britann. Exsicc. 407, et Schimp.
Synops., Ed. I., 1860) Wheldon.
var. *purpurascens* (Schimp. Synops. Ed. I., 1860). Braithw., 48;
Dixon, 520.
f. *typica* Wheld. f. nov.
f. *versicolor* Wheld. f. nov.
f. *virescens* Wheld. f. nov.
f. *Renaudii* (Sanio, 'Bryol. Fragm. II.' in Hedwigia, 1887,
129).
- var. *falcifolium* (Ren. Musc. Gallic. Sect. Harpid. 1894, 387)
Wheldon. Dixon, 521.
f. *inundata* (Ren. *ibid.* 388) Wheldon.
[f. *heteroptera* (Ren. Moss Exch. Cl. Rep., 1905, p. 201)] a
doubtful form.
28. *W. Rotae* (De Not. Cronaca II., 1867, 24) Wheldon. Braithw., 48.
var. *trichophylla* (Warnst., 'Die europ. Harpid.,' Bot. Centrall.,
1903, 429) Wheldon.
var. *irrigata* (Ren. Musc. Gallic. Sec. Harpid., 1894, 386) Wheld.

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Part II. of **H. Kirk Swann's** new edition of **Synopsis of the Accipitres** (Diurnal Birds of Prey); *Erythrotriorchis* to *Lophoaëtus*, has been issued (Wheldon & Wesley, pp. 65-122, 6s.). It comprises all the species and sub-species described up to 1920, with their characters and distribution.

The Outline of Science (George Newnes, part 4, pp. 121-160, 1s. 2d.), edited by Prof. J. A. Thomson, deals with 'The Ascent of Man,' 'Evolution going on,' and 'The Dawn of Mind.' There are some remarkable plates (some coloured) and other illustrations, and even the recently discovered human skull in Rhodesia is figured and described.

Weapons and Implements of Savage Races (Australasia, Oceania and Africa), by Lt.-Col. **L. A. D. Montague**. London : Bazaar and Exchange and Mart Office, 239 pp., 10s. 6d. The author is an enthusiastic collector of 'savage weapons,' and for some years has been contributing articles to the *Bazaar*, in description of his specimens. These are now reprinted in the present volume, which contains particulars of the more typical weapons, with 131 illustrations. He refers to the probable uses of the various objects described, and gives hints on collecting, preserving and exhibiting. He considers that the ethnographical room in a museum is always popular.

Everyday Life in the Old Stone Age, by **M. and C. H. B. Quenell**. London : B. T. Batsford, 109 pp., 5s. By consulting various authorities, reading the numerous books recommended, and with faith in most that has been written, the authors have produced a book which, with its wealth of illustration, should help to increase the interest in archæological matters by children, for whom the book is prepared. If occasionally the authors have accepted as facts statements which may be fiction, or have become entangled in the maze of theories of ice-ages, these should not interfere with the object of the volume. There are seventy illustrations, with many of which imagination has played its part, and the various types of palæolithic man has a masterly 'family' resemblance.

Last Days in New Guinea, by **Captain C. A. W. Monckton**. London : John Lane, 287 pp., 18s. net. We recently referred to this author's book on 'Experiences of a New Guinea Magistrate.' This is a record of 'further experiences,' the appearance of which was threatened if the first volume met with success. It did. In the present work, Capt. Monckton continues the story of this interesting part of the world, and his wealth of illustration considerably adds to the value of the work, as the author has been able to judge the value of his pictures to the ethnologist, geographer, and general reader. His narrative is a bit unusual, but apparently it has its charms. 'Think of the advertisement,' said a press representative who came to interview the author. 'Think of hell, blazes and damnation,' he replied. And he left the pressman thinking. We like everything in the book but the photograph of 'the author' as frontispiece. We much prefer the niggers.

BRITISH ASSOCIATION : HULL MEETING.

THE British Association for the Advancement of Science is pressing forward with its arrangements for the meeting of the Association to be held in Hull next September. The President of the Association will be Sir S. C. Sherrington, President of the Royal Society, lately of the University of Liverpool, and subsequently Professor of Physiology at the Royal Institution. The following officers for the sections have been appointed:—

MATHEMATICS AND PHYSICS :—*President*, Prof. G. H. Hardy, F.R.S., Oxford. *Recorder*, Prof. A. O. Rankine. *Secretaries*, M. A. Giblett, Prof. H. R. Hasse, J. Jackson, Prof. A. M. Tyndall. *Local Secretary*, C. H. Gore, Hymers College, Hull.

CHEMISTRY :—*President*, Principal J. C. Irvine, St. Andrews. *Recorder*, Prof. C. H. Desch. *Secretaries*, Dr. H. McCombie, Dr. E. H. Tripp. *Local Secretary*, A. R. Tankard, Hull.

GEOLOGY :—*President*, Prof. P. F. Kendall, Leeds. *Recorder*, Dr. A. R. Dwerryhouse. *Secretaries*, Prof. W. T. Gordon, Prof. G. Hickling. *Local Secretary*, A. Charlesworth, Brunswich Avenue Senior School, Hull.

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ANTHROPOLOGY :—*President*, H. J. E. Peake, Newbury. *Recorder*, E. N. Fallaize. *Secretary*, Dr. F. C. Shrubsall. *Local Secretary*, Dr. Leslie Jeffcoat, Hull.

PHYSIOLOGY :—*President*, Prof. E. P. Cathcart, F.R.S., Glasgow. *Recorder*, Dr. C. Lovatt Evans. *Secretary*, Dr. J. H. Burn. *Local Secretary*, Dr. J. Fraser, Medical Officer, Hull Education Committee.

PSYCHOLOGY :—*President*, Dr. W. H. R. Rivers, F.R.S., Cambridge. *Recorder*, C. Burt. *Secretary*, F. Watts. *Local Secretary*, Miss C. T. Cumberbirch, Municipal Training College, Hull.

BOTANY :—*President*, Prof. H. H. Dixon, F.R.S., Dublin.

Recorder, F. T. Brooks. Secretary, Prof. J. McLean Thompson. Local Secretary, J. F. Robinson, Estcourt Street Council School, Hull.

EDUCATION:—President, Sir R. Gregory, Editor of *Nature*. Recorder, D. Berridge. Secretaries, C. E. Browne, Dr. Lilian J. Clarke. Local Secretary, Dr. J. T. Riley, Director of Education, Hull.

AGRICULTURE:—President, the Rt. Hon. Lord Bledisloe, Lydney Park. Recorder, C. G. T. Morison. Secretary, Dr. G. Scott Robertson. Local Secretary, J. Strachan, Laurel Avenue, Perth Street, Hull.

The other officials for the Hull Meeting are:—Hon. Local Secretaries, H. A. Learoyd, M.A., LL.B., Town Clerk; T. Sheppard, M.Sc., Museums Curator; Hon. Local Treasurer, T. G. Milner, City Treasurer; Rooms Secretary, J. V. Saunders, M.A., Hull.

Forms of application for membership should be obtained from Mr. Sheppard.

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SOUTH-WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.

THE Annual Meeting was held at Huddersfield, on January 23rd, 1922, at the invitation of Mr. G. T. Porritt. The president, Mr. B. Morley, was in the chair. Mr. Mosley, the Curator of the new Huddersfield Museum, made an appeal for the co-operation of the Society in working out the entomology of the district, and supplying material for the museum collections.

EXHIBITS:—Mr. G. T. Porritt, a specimen of *Ptychoptera minuta*, taken by himself at Hornsea, Yorks., June, 1908, probably the earliest known example of this crane-fly. Mr. B. Morley, various hepialids including the whitish Wicken form of *H. lupulinus*, and *H. humuli* var. *thuleus*; *Larentia concinnata* Arran, and varied series of *L. truncata* including ab. *rufescens* from Skelmanthorpe; *Lygris populata* ab. *mausauaria* from Penistone; *Acrionicta menyanthidis* ab. *suffusa*, a second brood specimen from Penistone; aberrations of *Agrotis nigricans*, *Lygris testata* and *Ephyra pendularia*. Mr. Mosley, a collection of micro-lepidoptera taken at Diggle by Mr. F. Buckley. Mr. E. A. Smith, a long series showing range of variation in *Agrotis fimbria* Elland, 1921, one specimen having the black band of the hindwings traversed by black rays. Mr. E. Cocker, aberrations of *Arctia caja*, one with yellow and one with heavily suffused hindwings. Mr. J. Hooper, series of hybernids including melanic *H. leucophearia* and *H. aurantiaria* ab. *fuscata*. Mr. W. Buckley, *Euclloe cardamines* ♂ with the patches of a faded lemon colour, a faint subterminal grey streak and a grey streak prolonging discal spot to costa. Mr. W. Dyson, two aberrant specimens of *Pyrameis atalanta*, portions of the bands in one being of a bright orange colour. Mr. T. Fisher, aberrations of *Xanthia lutea* having the 'pink bar' intensified and brown in colour; aberrations of *Abraxas grossulariata*, including ab. *nigrosarsata*. Dr. H. D. Smart, a series of *Camptogramma bilineata* including ab. *atlantica* and ab. *isolata*; *Ennomos quercinaria*, banded and melanic forms; melanic forms of *Hemerophila abruptaria*, *Tephrosia consonaria*, and *Acidalia virgularia*. Mr. Porritt, as far as time allowed, showed portions of his collection of British lepidoptera, a description of which is beyond the scope of these notes.—H. D. SMART.

NORTHERN NEWS.

The death is announced of Dr. T. A. Chapman, F.R.S., the well-known entomologist.

Sir David Prain is retiring as Director of the Kew Gardens. He is succeeded by Dr. A. W. Hill.

Horace Donisthorpe contributes 'Myrmecophilous Notes for 1921' to *The Entomologist's Record* for January.

Messrs. W. A. Lee and W. G. Travis have favoured us with a reprint of their valuable paper on 'The Muscineae of the Wirral,' reprinted from *The Lancashire and Cheshire Naturalist*.

'The Utility of Modern Museums' is the title of an address recently given to the Belfast Rotary Club by Arthur Deane, Curator, and issued by the Belfast Museum Committee (12 pp.).

We notice the Maidstone Museum and Public Library is issuing a reprint from the local press entitled 'Notes on Recent Additions to the Collections, by the Curator.'

The well-known 'Strangers' Hall,' at Norwich, and its varied antiquarian contents, has been handed over to the Norwich Corporation, as a historical museum, by Mr. L. G. Bolingbroke.

Mr. J. Hetherington has recently placed a large wood at the disposal of the Yorkshire Philosophical Society as a bird sanctuary. We should like to see Spurn Point, Hornsea Mere, and other similar areas preserved in the same way.

The Annual Meeting of the Yorkshire Naturalists' Union, to be held towards the close of the present year at Scarborough, is by the kind invitation of the Scarborough Philosophical Society and the Scarborough Naturalists' Society. It will be a success.

Part 6 of *The Outline of Science* has some beautiful coloured plates and numerous other illustrations, the principal article being 'The Wonders of Microscopy.' There are some photographs of the Aegir on the Trent, which are some of the most remarkable we have seen.

The Council of the Geological Society has this year made the following awards:—Wollaston medal, Dr. A. Harker; Murchison medal, Mr. J. W. Evans; Lyell medal, Mr. C. Davison; Wollaston fund, Dr. L. J. Wills; Murchison fund, Mr. H. Bolton; and Lyell fund, Mr. A. Macconochie and Mr. D. Tait.

Among the contents of *The Mineralogical Magazine* for December, we notice 'Biographical Notices of Mineralogists recently deceased; with an index to those previously published in this magazine,' by L. J. Spencer; and an interesting paper on 'Curvature in Crystals,' by the same author. Both contributions are illustrated.

Part XXX. of Buckman's *Type Ammonites* completes Volume III. of that valuable work. Among the plates we observe an excellent one of *Ammonites binatus*, Bear MS., from the Castle Rock, Scarborough. Mr. Buckman gives the genus *Binatisphinctes* to one specimen labelled *binatus*, and *Hamulisphinctes hamulatus* to another, and *Hamulisphinctes auricula* to another, all from the same locality.

The Journal of the Manchester Geographical Society, Vol. XXXVI., recently published, contains two papers of particular interest to northern readers, viz., 'The Geography of Britain at the Time of the Arrival of Man,' by Sir William Boyd Dawkins, and 'Some Geographical Factors in the Evolution of Navigation,' by C. B. Fawcett.

The tragically sudden death of Mr. Charles Hadrill, the widely-known and able assistant in the General Library of the British Museum (Natural History), will cause universal regret. His long association with Mr. B. B. Woodward and wide acquaintance with scientific literature had lightened the labours of many a student and assured him many friends.

'Luminous Owls' seems to be the subject of discussion, among several of them, in certain 'Dailies' just now.

The Foulerton Award of the Geological Association has been given to Messrs. C. Davis Sherborn and Martin A. C. Hinton

In *The Entomologist* for January, E. Meyrick alters the name *Mothonica* (previously used) to *Mothonodes*; and on the next page *D. excavata* is changed to *D. exhumata*, for the same reason.

We have received from Tokyo a paper 'On the Development of *Panulirus japonicus* (v. Siebold), by Arata Terao, published in the *Report of the Imperial Fisheries Institute, Japan*. It is well illustrated.

Among the numerous contents of the *Transactions of the Dumfriesshire and Galloway Natural History and Antiquarian Society*, recently published, we notice: 'Plants of Holms, Merselands, and River Valleys,' by G. F. Scott Elliot; 'The Marine and Fresh-water Fishes of Wigtownshire,' by J. G. Gordon; and 'A List of the Coleoptera of the Solway District,' by B. M'Gowan.

The Louse as a Menace to Man; its life-history and methods for its destruction, is the title of a twenty-page illustrated handbook, issued by the British Museum (Natural History) as its Economic Series No. 2. The pamphlet is by Dr. James Waterston, and refers to a subject which has received rather more than usual prominence in recent years. It is sold for the small price of 6d.

Hull Museum Publication No. 124, 'Wilberforce House: Its History and Collections' (8 pages), has been issued, and is being sold at the nominal price of one penny. It is felt that this will be more appreciated than the previously published Guide of 32 pages, which was originally sold at one penny, but has reached a figure, entirely due to printers' charges, which is prohibitive to the ordinary visitor.

'CONSTANT READER' writes:—'As I have devoted a good deal of attention to cryptog(ramic) botany, I beg to reply to your queries on p. 32 of the January issue of *The Naturalist*. The Arctic Fern is, of course, *Blechnum boreale*. The Common Fern is *Lastrea Filix-mas*, because it occurs in the neighbourhood of Leeds, and any fern found in such a locality must be a Common Fern. The latter is a migratory fern. A specimen of this fern recently seen a few miles from Leeds was shortly afterwards observed in a neighbour's garden, well within the City boundary. I once found a dead Common Fern on a rubbish heap, at Meanwood, where it had been shot!

The Annual Meeting of the Selby Scientific Society was held at the Museum recently. The secretary (Mr. J. F. Musham) read his report of the year's work. There had been a steady increase in membership, an improved average attendance at field meetings, and revivification of sectional activity, notably in photography. The treasurer's report showed the finances to be in a healthy condition, with a substantial balance in hand. The year's record of plants and fungi were dealt with in interesting reports submitted by Mr. J. B. Foggitt and Mr. W. N. Cheesman, J.P. Exceptional conditions arising out of the dry summer had produced a remarkable series of plants not commonly recorded, the larger areas of mud exposed to the sun being suggested as the probable cause. The retiring president, Mr. A. Hutchinson, proposed as president for the ensuing year Mr. J. C. Pike. This was carried. Mr. W. E. Hodgson was re-appointed treasurer. Mr. J. F. Musham was re-elected secretary, with many expressions of appreciation of the services rendered to the Society in that capacity for nine years. A reference was made to the intention of the Urban District Council to sell the books in the Museum Library, and the opinion was expressed that this was a mistake, and that the books should be retained until such time as there were others to replace them, and until the town was in possession of a public reference library, of which it is badly in need.

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Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
March 1st, 1922.

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A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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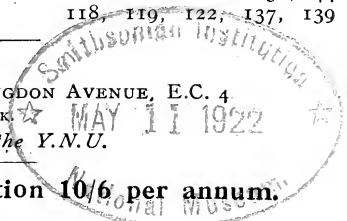
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EDITOR OF 'THE NATURALIST' AND OF VARIOUS SCIENTIFIC PUBLICATIONS
AND AUTHOR OF NUMEROUS VOLUMES ON HISTORICAL, GEOLOGICAL,
NATURAL HISTORY, AND LITERARY SUBJECTS.

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NOTES AND COMMENTS.

PLANT GALLS.

In order to secure uniformity with regard to the nomenclature used by the now increasingly large number of students interested in Plant Galls, Mr. Wm. Falconer has been in communication with the Plant Gall Committee of the London Natural History Society, and it is suggested that a general committee be formed containing representatives from various bodies particularly interested in this subject, in order to go into the whole question. At present the opinion seems to be that the 10th Edition of the London Catalogue should be the botanical authority to be followed, and the question of the entomological authorities remains to be settled. Agreement on these points should lead eventually to the compilation of an authoritative list of British Galls, inclusive (if so decided) of the fungal ones and others (Thrips, Aphrophora) not yet acknowledged in this country.

NATURELAND.

This spring has produced two new natural history journals, both awkward in size, and both excessively 'popular'! and we regret to say that we do not know that either fills a real want, nor are we sure of the class of reader catered for. The first is *Natureland*, a white-covered quarterly, edited by Dr. G. Renshaw, and published by Messrs. Sherratt & Hughes, Manchester, at 10/6 per annum. It contains articles on Bird feeding, Black Rat, Hiding Instinct of Birds, Ornithological Notes from Cyprus, Pond collecting, Parrakeet Acclimatization in England, Breeding of the Black-capped Lory. There is a Review of a book dated twelve years ago, the publisher being long since dead. There are four plates, one called 'Dawn,' being a moth larva. The publication measures $7\frac{1}{4}$ in. by 10 in. and contains twenty pages.

THE NATURE LOVER.

The other rejoices in the above title, is edited by Dr. F. H. Shoosmith, is published monthly by Messrs. Smith & Sons and a whole army of booksellers, measures $6\frac{1}{4}$ in. by $9\frac{3}{4}$ in., has a yellow cover, contains 32 pages, and is sold at 7d. There is a Japanese Bird Study as frontispiece; we are then told the 'Earth is crammed with heaven and every bush afire with God,' there are references to poets, followed by 'Out and about in March,' and then articles on The Daffodil, A Bird's Egg, The Rainbow, and a review of a book. Most of the articles contain quotations from the poets, in smaller type. The publication is clearly a spring product, and we shall be interested in seeing what the sear and yellow leaf looks like when the autumn comes.

BRITISH ASSOCIATION REPRINTS.

The British Association for the Advancement of Science is issuing a new series of reprints, beginning with a selection of communications given at the Edinburgh Meeting, 1921, including : (1) Science and Ethics, by E. H. Griffiths, Sc.D., F.R.S., 9d. ; (2) Discussion on the Structure of Molecules, 9d. ; (3) Report on Credit, Currency, Finance, and Foreign Exchanges, 1s. 6d. ; (4) Report on Complex Stress Distributions in Engineering Materials, 3s. 6d. ; (5) Report on Charts and Pictures for use in Schools, 1s. ; (6) Report on the Practicability of an International Auxiliary Language, 1s. ; (7) Report of the Conference of Delegates of Corresponding Societies, including Sir Richard Gregory's address on the Message of Science, and T. Sheppard's Bibliography of Papers on Zoology, Botany, and Prehistoric Man, relating to the British Isles, published in 1920, 2s. These are on sale at the office of the Association, Burlington House, Piccadilly.

YORKSHIRE NATURALISTS' UNION.

At a recent meeting of the executive committee of the Yorkshire Naturalists' Union, a strong sub-committee was formed in order to assist in connexion with the Hull meeting of the British Association for the Advancement of Science in September. One object of this sub-committee is to illustrate the various and numerous activities of the sections and committees of the Union in the form of an exhibition at Hull, so that the British Association may be able to see the results of research on the part of the members of one of the most important Natural History Societies in the provinces. Will the secretaries of the sections and committees and others interested, please communicate with the Secretaries of the Yorkshire Naturalists' Union, at the University, Leeds, in order that work may be commenced at once, and on the right lines.

MARVELS.

The Entomologist's Record draws attention to the following note appearing in the recent issue of the *Daily Telegraph*, headed 'Plant Life Marvels':—'Some seeds are covered with a capsule, which bursts and scatters them broadcast. Others get distributed in the excrement of birds, and many foreign weeds are introduced to our lands by such means; and so are plants growing on walls, on church towers and other inaccessible places. Animals like the sheep will carry certain seeds of wild plants in their wool. Another remarkable growth is the fungus known as ergot, which thrives on the flowers of certain grasses in our meadows, and when eaten by sheep is said to produce the disease known as "fluke," or perforation of the life organs by a sort of maggot.'

ANOTHER.

The *Daily Chronicle*, a little while ago, published an extraordinary letter stating that well-known Naturalists' names are absent from the New Years' Honours List, and three names were suggested as suitable for inclusion (though whether as Lords or Dukes was not stated), viz., Richard Kearton, W. Percival Westell and Oliver G. Pike. One of these gentlemen has evidently taken the suggestion seriously, and, after a lapse of over five weeks, wrote the following letter to the same paper: 'I have only just noticed that in a letter in a recent issue, your correspondent flatteringly suggests that my name should sooner or later appear on the Honours List. In moments of depression, such a letter as that written by your correspondent stimulates and inspires one for further new effort, and I am deeply grateful for the suggestion he kindly puts forward. Perhaps some day the work of those who have, during the last twenty years or more, fostered and stimulated a love for Nature will be duly recognised.—W. Percival Westell, F.L.S.' Marvels, indeed, again! If a naturalist *is* to be so honoured, we know of hundreds who should have preference.

PILTDOWN MAN.

In the November-December part of *Natural History*, the Journal of the American Museum of Natural History (New York, 1921, Vol. XXI., No. 6), Dr. Henry Fairfield Osborn has generously written a complete retraction of his earlier views on the nature of the Piltdown Jaw, an error into which he had been led by the hasty generalisations of Gerritt Miller and others, who had not seen the original specimens. Thus it becomes necessary to warn our readers against the 'Chimpanzee' nonsense printed by Miller, by Osborn himself, by Boule and others, and to give to Dr. Smith Woodward the full credit for his skill and acumen in deciphering the remains found by Dawson, himself and Teilhard in the gravel deposit of Piltdown. Dr. Smith Woodward was, indeed, wise in not replying to his hasty critics. All honour to Dr. Osborn for his courteous and generous retraction.

A NEW PARKER AND HASWELL.*

This, the standard text-book on this subject, is too well-known to teachers and students alike to require any recommendation from us. All we can do is to draw attention to the fact that still another edition has been published from the house of Macmillan, who have brought it out in the lavish way characteristic of that firm. The volumes are absolutely indispensable to the Zoologist, and too much praise cannot

* *Text-Book of Zoology*, by T. Jeffrey Parker and William A. Haswell, 2 vols., pp. xl.+816 and xx.+714 (London: Macmillan & Co.), 50/- net.

be given to the care with which the 1250 illustrations have been drawn in order to give the maximum amount of information to the student without confusing him. Some of these are coloured in order to show arteries, etc. The present edition has been entirely revised; additional illustrations have been given, certain portions have been re-written, notably in the sections relating to the Nemathelminthes, Molluscoïda and Annulata.

MUSEUMS OLD AND NEW.

Mr. O. G. S. Crawford replies to some criticisms of his book on 'Man and his Past,' recently made in *The Museums Journal*, in order to substantiate some remarks he made in his book. From this we quote the following, and feel relieved, either that Mr. Crawford has not been up in the north, or that he considers our Northern Museums are satisfactory. He states:—'Possibly there are in some remote towns a few museums so unaffected by the reforming spirit, etc. There are; but they are not all remote. I have twice visited Hereford Museum. The first time (in 1919), I admired an interesting old map of the county hung in the entrance. The next time (in 1921) it was hidden behind a huge stuffed crocodile ('Presented by Lady . . .'), disporting himself in a glossy coat of varnish, and surrounded by rocks and vegetation that must have been very unfamiliar to him. On my second visit I failed to find some bronze implements I had drawn on my first. They may be there still, but the point is that I could not find them. Portsmouth cannot be called a "remote" town; but its museum is, I think, almost the worst I know. Southampton, I regret to say, runs it close, though the material in it (mostly unlabelled) is second to none—barring its "tabular flints," of course. The labels which do exist are either useless or misleading. Bath Museum has labels, but the cases are filled with a disorderly jumble of specimens, many of them of great archæological value; it feels like a tomb. Caerleon and Cirencester Museums are not unlike each other. Both have fine material covered in dust. The iron objects in both need immediate attention. The same is true of those in the museum at the Chedworth Villa. Dover Museum, from what I remember of it about ten years ago, was unlabelled and dusty. So, probably, is Folkestone, although the day I called (when returning from leave during the war, and delayed half a day there) the caretaker was dusting it, and would on no account allow me to enter. But the real gem is at Frome, Somerset. Only members of some trumpery local "philosophical society" are admitted, a privilege rarely exercised, one would imagine. It contains two specimens of archæological interest; one is a forgery, and the other has no site.'

CORNUS SUECICA LINN. AND *MYRICA GALE* LINN.
ON THE YORK MOORS.

HAROLD J. BURKILL, M.A., F.R.G.S.

LAST year I managed, when on holiday on the York Moors, to inspect one of the chief habitats of *Cornus suecica*. The plants there were apparently not thriving, and the colony seemed in danger of being exterminated. The few specimens I saw were very small, growing under Bracken, and there was no sign of flower or fruit. Possibly they were suffering more from the dry weather than the Bracken was, and with a return to more moist conditions the *Cornus* may revive. Otherwise the much reduced numbers of the plant lead one to the conclusion that the colony is disappearing, being so much smaller than it was when I saw it in 1904, 1905 and 1909.

This is the only patch of *Cornus* that I know growing among Bracken, and I don't think the fern showed any difference in density than it did when I was there in 1909. All the other lots of *Cornus* are among the Heather. I was unfortunately not able to get over to Goathland to visit the largest patch.

From the appearance of the country drained by the head waters of Little Beck in Iburndale, I should not be surprised to hear of *Cornus* being found in that district.

The Bracken on Dalby Warren showed very plainly the effect of the drought, being stunted and only eighteen inches to two feet in height. In former years it was not unusual to find large areas where it was well over six feet high and almost impossible to force a passage through.

Myrica Gale is another attractive moorland plant. Mr. Elgee gives many details of its occurrence in 'The Moorlands of North-eastern Yorkshire.' It seems to be spreading in the Derwent and Juggera Valleys, and in September I paid three visits to the head of the latter, and I was able thoroughly to examine the swamps drained by Biller Howe Beck.

It is well established all along the southern margin of the depression among the Heather, especially where there were hollows in the slope and the ground was wetter. It has not yet, however, reached the watershed between Biller Howe Beck and Blea Hill Beck, nor did I notice it on the steep slope down to the latter valley, but it occurs down by the stream. Mr. Elgee had noticed it only in the lower portion of the Biller Howe swamp when writing in 1912. It is plentiful in the lower part of the drainage dip from Foul Sike, but I failed to find it in the upper portion.

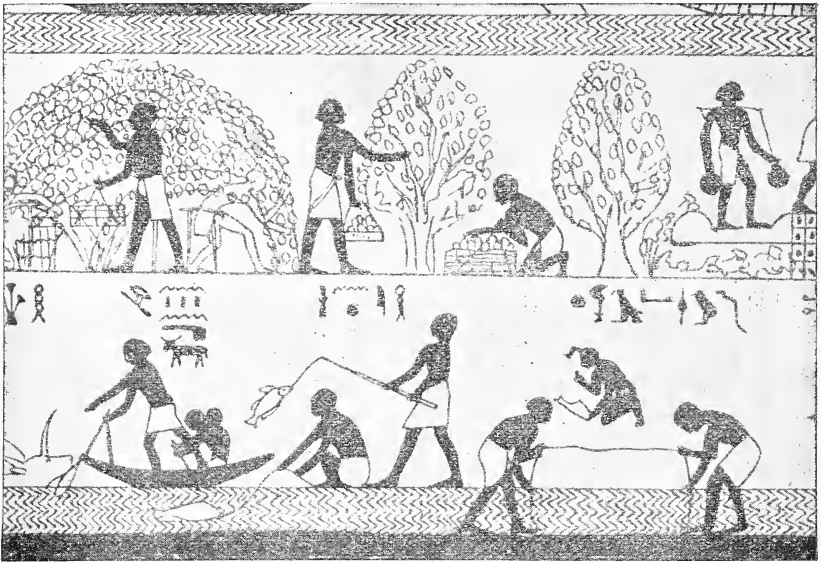
There was a great advantage in 1921 for closer examination of the Moorland flora, as it was possible to walk about most

of the *Juncus* swamps, which in ordinary years are almost impassable.

Potamogeton natans looked very much out of place clinging to hummocks of peat left almost dry by the evaporation of the ponds and swamps on some of the higher portions of the moors, and was growing more as a compact rosette with short leaf stalks than as a water plant. It was, however, normal in many of the ponds that remained through the drought.

—: o :—

Fishing from the Earliest Times, by W. Radcliffe. John Murray, 478 pp., 28s. The author tells us he was asked to give a quotation from



The earliest representation of angling, c. 2000 B.C.

Homer for his sister's game-book, and as a result, his interest in the subject—like Topsy 'grewed, I spects.' However, it is apparent that since the days of his sister's game-book, all has been fish that has come into his net—which he seems to have 'far-flung.' Assyrian and Egyptian monuments, Greek and Roman pottery, early mosaics, friezes, Indian antiquities, Esquimaux and modern savages have all contributed their load to Mr. Radcliffe's net. His quotations from the Greek, Chinese, Peruvians—in fact from all the ancient civilizations—with a wealth of footnotes and quotations, indicate the extent of his researches. He is able to illustrate the art of the angler during four thousand years, giving an illustration of fishing with a rod so early as 2000 B.C. Judging from the numerous illustrations in this book, the desire for 'big fish' has existed from all time—even the early Egyptian representations of the piscatorial captures being obviously exaggerated! By the courtesy of the publisher we are able to give a reproduction of one of the numerous illustrations to this interesting volume.

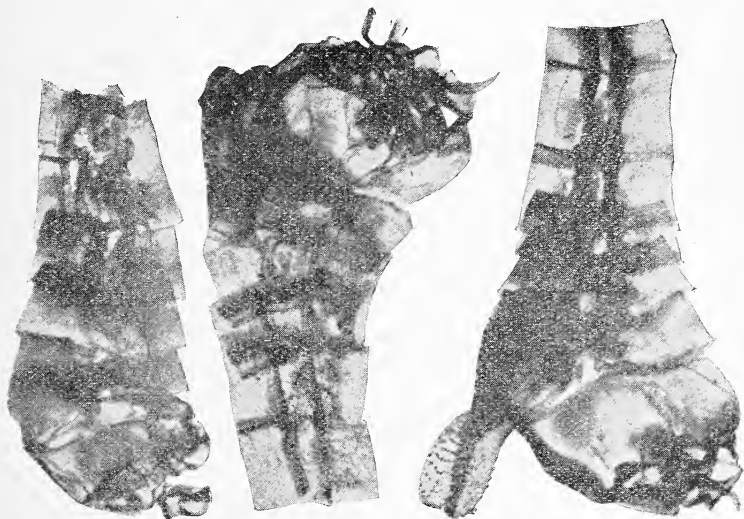
TIPULA CONFUSA, v. D. WULP.

CHRIS. A. CHEETHAM.

UNDER this name we have many records for an insect which is a widely distributed and common species in Yorkshire.

It belongs to a small group which have marmorated wings; antennæ of normal length with basal segments yellow; thorax with four non-bordered stripes; the wings with normal 'Tipula' venation and the tips not darkened.

The species was described by v. d. Wulp, *Tijdschr. v. Ent.*,

*T. marmorata* Mg.*T. anonyma* Bergr.*T. signata* Staeg.

XXVI., 176, where he stated that the *marmorata* Meig. of his Dipt. Neerl., I., 363, was, in his opinion, not the insect Meigen had described; he also stated that a specimen since given to him by Dr. Mik was the true *marmorata* Meig. Wulp gives keys and describes the difference between his *confusa*, *marmorata* and *signata*, and this was adopted by Verrall (*Ento. Mon. Mag.*, XXII., 201.), and later by Wingate (*Trans. Nat. Hist. Soc. Northumberland, etc.*, N.S., Vol. II.).

A reference to more recent continental workers shows that Wulp's later statement has not been accepted. Bergroth (*Wien. Ent. Z.*, 1889, 119), states that Wulp's *confusa* is the genuine *marmorata* Meig., and that the species received by Wulp from Mik was a species which had not been recognised previously, and Bergroth named it *anonyma*. Under these three names: *marmorata* Meig., *anonyma* Bergr., *signata* Staeg.,

the species will be found in the *Katalog. Paläarkt.* Dipt., I., 327, 332, 339, and references to some or all occur in Strobl *Mitt. ver. Steiermark*, 1894, 208., Riedel *Abh. Lehr. Crefeld*, 1913, Goetghebuer and Tonnoir *Bull. Soc. Ent. d. Belg.*, 1920. The drawings by Wulp in his last paper are very useful, but as the publication is not easily accessible to Yorkshire dipterists, I have mounted and photographed the genitalia of three species taken in Yorkshire which agree with his drawings and descriptions.

T. marmorata Meig. (*confusa* v. d. Wulp.) is widely distributed, and frequently taken on walls quite as often in towns as in the open country districts; it is smaller in size than the other two, the ♂ is easily separated as the illustration will show, but the ♀ is not so easily distinguished, the pleuræ are whiter and contrast with the redder abdomen, and the wings are more decidedly marmorated.

T. anonyma Bergr. and *signata* Staeg. approximate closely in size and general appearance; again there is no difficulty with the ♂s. Wulp gives as a guide the brown side stripes on the abdomen of *signata*. I have not found this very satisfactory, over a series the stigma of *anonyma* seems darker and shorter than that of *signata*, but the two females are very much alike.

I found *anonyma* Bergr. near Austwick, 16-ix-21, in a small wood with open ditches carrying water from springs, and later in the month and in October I found *signata* Staeg. with it in similar places near Austwick and at Helwith Moss; these two species appear to be recognised as autumn species by previous writers. *T. anonyma* Bergr. is much rarer than *signata* Staeg, and is not mentioned by Strobl and Goetghebuer.

Wingate's table is satisfactory if the *confusa* be altered to *marmorata* and the *marmorata* to *anonyma*.

—: o :—

Man for February includes a paper on 'The Cephalic Index of the *British Isles*,' by F. G. Parsons. 'Some' index!

Dr. Walter E. Collinge contributes 'Food and Feeding Habits of the Little Owl' to *The Journal of the Ministry of Agriculture* for February.

Prof. Kendall severely criticises Prof. J. W. Gregory's paper on English Eskers in *The Geological Magazine* for March. In the same journal Mr. G. W. Lamplugh writes on the Easington (Durham) raised beach.

Among the contents of *British Birds* for March we notice a continuation of W. Rowan's illustrated observations on the breeding habits of the Merlin, and a report on the 'British Birds' Marking Scheme for 1921,' by H. F. Witherby.

Among the numerous and well-illustrated papers appearing in the numbers of *Conquest* recently published, we notice 'Exploring the Upper Air,' 'Dogs and Wolves,' 'The Vanishing Salmon,' 'Colour Cinematography,' 'Where do Flies go in the Winter Time,' 'Diamond Cutting,' 'The Grey Squirrel,' and 'Pearls.'

STATICE LIMONIUM ON THE NORTH BANK
OF THE HUMBER.

T. PETCH, B.A., B.Sc.

(Continued from page 96).

Statice Limonium has long-styled, short-styled, and intermediate flowers. These, with the correlated differences in the flowers, have been described by MacLeod (*Bot. Centralb.*, Bd. 29, pp. 152-3). At Cleethorpes all three forms occur, but I was unable to find any but long-styled flowers on the Yorkshire side of the Humber. Flowers collected at Burnham-on-Crouch on October 8th, 1904, showed all the forms, about one-third being long-styled; but among the short-styled forms were all possible lengths of style up to the intermediate, and the separation of these two forms was somewhat arbitrary.

In common with other members of the *Plumbaginaceae*, *Statice Limonium* has peculiar glands, known as 'organs of Licopoli' or Mettenius glands, on the leaf. These, viewed from the surface, are circular, and consist of eight cells. In *Statice Limonium* they are slightly sunk below the level of the surface of the leaf, but are not overarched by the surrounding epidermal tissue. Viewed from the surface, one sees two concentric circles, crossed by two diameters at right angles to one another, and a central square with its corners on the two diameters. Each gland consists of four central cells, triangular in plan, followed by four trapezoidal cells, and surrounded by an annulus composed of four narrow, curved cells. The gland in shape is semi-ellipsoid, the surface being perpendicular to the major axis, and its component cells meet in fours on the major axis. The eight inner cells are regarded as the secretory cells, the outer four being styled accessory cells.

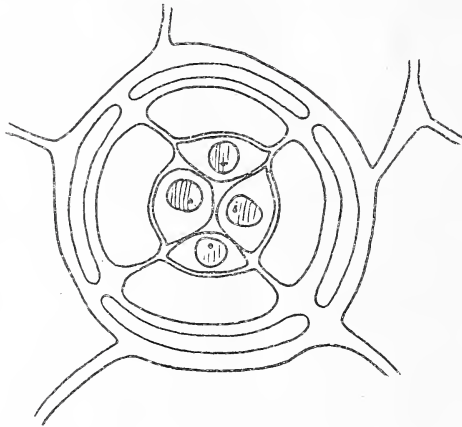
In some species of *Statice*, these glands excrete calcium carbonate: in *Statice Limonium* they excrete salt, which can sometimes be seen in glistening particles on the leaf.

Naturally, these glands have attracted the attention of botanists, and several papers have been written on the subject. Maury (*Ann. Sci. Nat. Bot.*, Ser. 7, IV. (1886), p. 1) claimed that there were not eight central cells, but only four; these four separated from one another in the centre, and thus gave a fictitious appearance of eight; the four cells secreted calcium carbonate, etc., into the space between them, and this was ejected by the pressure of the turgescient cells through a hole in the middle of the gland.

Maury's account was adopted by Engler-Prantl (*Pflanzenfamilien* IV., 1, p. 117). It had, however, been contra-

dicted by Vuillemin (*Ann. Sci. Nat. Bot.*, Ser. 7, V., pp. 152-177), who showed that there were really eight cells, that they did not separate from one another, and that there was no central hole through which a solid mass could be extruded.

It is generally accepted that the glands of the *Plumbaginaceae* constitute an apparatus for getting rid of an excess of salts absorbed by the plant. But the difficulty in explaining their action lies in the fact that the external surface of the gland is strongly cuticularised. On staining with chlorzinc iodide, the face of the gland is coloured yellow. Vuillemin found that, in the middle of each of the central triangles, there was a minute spot (un petit trou), about two-thirds of a μ in diameter, which did not stain with



Face of the gland of *Statice Limonium*, \times 800.

With Chlor-zinc Iodide the face stains yellow, but the four shaded areas stain blue; and the spots indicated by the four black dots remain unstained.

chlor-zinc iodide. At that point, therefore, the cuticle was interrupted. He was not able to determine whether the spot consisted of a thin membrane, not stainable with chlor-zinc iodide, or whether there was really a hole there. He writes 'Cet orifice, véritable canal excréteur, creusé dans la cuticle, assure la sortie des produits d'élimination sans entraîner un excès de transpiration.'; and in describing his figure 7 he states, 'On distingue la trace de l'insertion des cloisons de la glande et dans chaque petit triangle interne un orifice excréteur.' But in view of his doubt, previously expressed, his language was probably figurative.

Prior to consulting the literature on this point, I had examined the glands of *Statice Limonium* by the same method as that employed by Vuillemin. The epidermis, with the

gland faces, was removed from the leaf by boiling with caustic potash. It was then mounted and stained with chlor-zinc iodide. When examined under a low magnification, the gland appeared yellow, but on examination with a one-twelfth oil immersion, it was found that in each of the four inner sectors there was a circular area which stained blue, and, towards the inner side of this area a minute white spot which looked like a hole. According to this result, there is in each of the central triangular sectors, an area which is not cuticularised, and consequently secretion can occur through those areas. These are additional to Vuillemin's 'trou,' whatever the nature of the latter may be.

Counts were made of the number of glands and stomata per square millimetre of leaf surface on leaves from different localities. They are arranged in order of normality of station, the normal leaf from Welwick first. The data concerning the sizes of the leaves has unfortunately been mislaid, but they may be taken as typical of their respective localities. Counts were made from different parts of the leaf, and each number is the mean of twelve counts on the same leaf.

	<i>Upper surface.</i>	<i>Lower surface.</i>
Welwick (E)	14 glands+96 stomata	15 g.+51 s.
Hedon Haven (B) ...	5 g.+30 s.	5 g.+20 s.
Saltend (A)	14 g.+63 s.	14 g.+53 s.
Kilnsea (F)	20 g.+96 s.	19 g.+81 s.
Easington (G)	14 g.+53 s.	14 g.+40 s.
Easington (G)	10 g.+103 s.	12 g.+70 s.
Garden plant	9 g.+65 s.	10 g.+59 s.

The number of glands is about the same on either side of the leaf. In all cases, however, stomata are more numerous on the upper side than on the lower. The difference between the numbers on leaves of normal size from Welwick and on abnormally large leaves from Hedon Haven is due to the fact that the increase in leaf area was accompanied by an increase in size of the epidermal cells : the number of epidermal cells seen along a diameter of the field of the microscope in the latter was only half that seen in the former. There is no difference between the numbers of glands per square millimetre on the normal leaves from Welwick and the small leaves from Saltend and Easington ; but the further data necessary for comment on this is lacking.

The ratio of the number of glands to the number of stomata per square millimetre is given in the following table :—

	<i>Upper Surface.</i>	<i>Lower Surface.</i>
Welwick (E) ... ..	... 1 : 6.9	1 : 3.4
Hedon Haven (B) ...	... 1 : 6	1 : 4
Saltend (A) ... ..	... 1 : 4.5	1 : 3.8
Kilnsea (F) ... ..	... 1 : 4.8	1 : 4.3
Easington (G) ... ..	... 1 : 3.8	1 : 2.6
Easington (G) ... ..	... 1 : 10.3	1 : 5.8
Garden plant ... ..	... 1 : 7.2	1 : 5.9

On leaves from the first two stations, where the plants are practically equally exposed to submergence, the ratios are nearly the same. It might be expected that the plants in other stations, which grew at a higher level, and were not submerged so often, would show a smaller ratio of glands; except in one case, however, they show a larger ratio. With regard to the two sets of figures from Easington ('G'), these refer to leaves from the two patches on the same enclosure: there is no obvious reason why they should be so different. On the plant transferred to a garden at Hedon, the ratio of glands to stomata is actually smaller than in the case of the Welwick leaves, but the difference is only small. It should be noted that all these figures were the result of preliminary observations which, owing to the circumstances already explained, could not be subsequently checked.

It is remarkable that *Statice binervosa*, which occurs to the south of Cleethorpes, is not found on the north bank of the Humber. Similarly, *Statice reticulata*, which is common in the saltmarsh at Holme, on the Norfolk side of the Wash, does not (if my information is correct) pass over into Lincolnshire.

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Dr. J. A. Clubb writes on 'The Public Museums of Liverpool' in *The Museums Journal* for February.

The *Revue de Géologie* for January contains over a hundred pages of valuable extracts of geological papers.

The death is announced of W. L. Distant, at the age of seventy-seven. He was at one time editor of *The Zoologist*.

A. S. Corbet gives 'Notes on the Breeding of the Marsh-Warbler in Berkshire,' in *British Birds* for February.

Mr. J. E. Clark contributes 'Flowering Dates of Trees along Main British Railway Routes' to *Nature*, No. 2729.

Dr. J. Ritchie describes a case of extraordinary adaptability of a stoat, in *The Scottish Naturalist* for January, and in *Country Life* for March 18th.

In the 'Sportsmen we all know' series, the *Shooting Times* for March 4th has an excellent memoir and portrait of our contributor, Sydney H. Smith, of York.

W. J. Lucas contributes 'Notes on British Neuroptera in 1921' to *The Entomologist* for March, and that Journal contains a good number of interesting field records.

The Rev. Henry Hugh Huggins, a Liverpool Naturalist, and the first President of the Museums Association, is the subject of a Memoir by Annie Lee in *The Lancashire and Cheshire Naturalist* for January.

'Hybrids of *Orchis purpurella*,' by T. and T. A. Stephenson; 'Flowering-times of some British Elms,' by Miller Christy; 'New or Noteworthy Fungi,' by W. B. Grove; and several shorter notes, appear in *The Journal of Botany* for February.

An urgent appeal for new subscribers is made in *The Lancashire and Cheshire Naturalist* recently to hand, otherwise the serious loss during the last three years (£150) will result in the journal ceasing publication. The part just received (Vol. XIV., No. 4) is remarkably valuable, and we commend the policy of the editor in reference to printing scientific rather than the so-called 'popular' material.

TURTLE DOVE IN YORKSHIRE.

SYDNEY H. SMITH.

IN recent years this species is increasing its range in Yorkshire. The principal district frequented by the species in England is defined by a line from Bristol to Holyhead, thence to the Wash, south to London, and then across to Bristol. In this way is marked out well-wooded country that is the natural home of a bird of this kind. Lincolnshire, Derbyshire and the West Riding of Yorkshire is either not wooded, or is too densely populated to offer suitable environment, but proceeding through mid-Yorkshire, there are plenty of arboreal haunts to attract the Turtle Dove; hence the increasing number of records recently points to the fact that this handsome little dove had begun to appreciate the attractions of Yorkshire. This increase may be the result of successful breeding on the part of pioneer pairs, the progeny of which are returning during the spring immigration to places where their early life was spent. It would be helpful if young birds were marked during the next few years in order to find out what proportion returned to the place of their birth.

Our earliest Yorkshire records date from the time of T. Allis, and are dealt with in 'The Birds of Yorkshire'; and in 1844 Allis mentions that a turtle dove had been shot near Halifax 'some years previously.' Evidently the species was rare in Yorkshire during the nineteenth century, there being few records, though no doubt partly due to lack of observers. A turtle dove was shot near Rotherham in 1824, and another at Teesmouth in 1837. Usually turtle doves depart in August, but, like landrails, odd ones occasionally outstay their summer visit beyond the ordinary, as 'The Birds of Yorkshire' records a turtle dove as having been shot at Beverley on November 18th, 1865. Apparently the farthest northerly range of the species is Cumberland, where it has been noted twice and recorded in the B.O.U. Migration Report. 'The Birds of Yorkshire' records many isolated instances of the occurrence of the bird in Yorkshire.

The observations of the British Ornithologists' Union, published in their Migration Reports, point to the main arrival of the species as occurring between May 4th and 18th, and stragglers keep arriving from overseas until well into June. The movement is almost entirely northerly, all the early records being from the south coast, as the following extracts will prove :—

1908	Turtle Doves arrived on South Coast	April 24	; Yorkshire	May 11
1909	do.	do.	April 28	do. May 1
1910	do.	do.*	April 19	do. May 17
1911	do.	do.	April 18	do. May 12
1912	do.	do.	April 13	do. May 7

I have, with the help of Mr. Zimmerman, obtained a few details from the records of the York Naturalists' Society, and tabulate them below :—

- 1908 A nest with 2 eggs was seen at Crayke, Easingwold, on June 5th, and the female was sitting at the time of the discovery.—V.Z.
- 1909 A turtle dove was seen at Sandburn on April 30th.—S.H.S. and a nest with two eggs was found at Shipton.—V.Z.
- 1910 A turtle dove was seen at Skipwith on May 12th.—S.H.S.
- 1911 A pair of turtle doves at Castle Howard on May 13th.—E. W. Taylor.
- 1912 A pair of turtle doves at Skipwith on April 27th, and a small party was observed at Aldby Park on April 29th.—S.H.S.
- 1913 No record.
- 1914 A pair of turtle doves and their nest and eggs at Skipwith on May 17th.—V.Z.
- 1915 A pair of turtle doves at Sandburn on April 23rd.—V.Z.
- 1916 A nest and eggs at Escrick on May 8th, and nests with eggs at Moreby Park, Stillingfleet Wood, and Moorlands Wood, Skelton.—V.Z.
- 1917 No record.
- 1918 A nest with young birds at Skelton, and nests and eggs at Alne Park, and Sutton on Forest.—V.Z.
- 1919 No record.
- 1920 A nest with young at Sandburn.—V.Z.
- 1921 A nest with young at Sandburn on June 20th.—V.Z.
A nest with young at Dunnington, on June 29th.—V.Z.
A nest with one young bird at Newton Kyme on July 1st.—V.Z.

A turtle dove was seen in Bramham Park on August 6th, V.Z. Several turtle doves were seen near Skelton early in May, and on May 16th a nest with two eggs was found by G. Howard.

I saw a pair of turtle doves at Dunnington on June 3rd, one at Thormanby on June 11th, one at Stillington on June 12th, and one at Raskelf on September 1st. On June 8th, Mr. Riley Fortune saw four turtle doves in a turnip field at Allerton Park, and states that there is an undoubted tendency on the part of this species to extend its range into Yorkshire.

Mr. H. B. Booth informs me that the species is a very rare visitor to the Ilkley district; he has, however, heard it in Harewood Park, and states that twenty-five years ago it bred in good numbers just south of Wakefield.

Mr. W. G. Clarke, speaking for the Scarborough neighbourhood, says that turtle doves have been increasingly plentiful during the past summer, and are extending their range in all directions, the number steadily multiplying for several years, this increase being noticeable as far north as Whitby.

* One only on March 31st.

Mr. Stanley Duncan informs me that, with his brother, Norman Duncan, he saw a pair of turtle doves come in off the sea and round Spurn Point at 11-30 a.m. on May 28th, 1921. This pair did not alight, but flew over the 'flats' to the north shore of the Humber. Close observation has been kept here all the summer, but no more turtle doves have been seen. It is evident from this note that there must be some slight immigration from over the North Sea, and it will be advisable to keep a close watch at the east coast arriving points for immigrant bird life, to find out whether there is any definite flight line for this species over the North Sea from the continent, as all the evidence we have at present seems to shew that the spring movement is all from the south coast toward the midland and northern counties.

Mr. W. J. Bramley, of Fairburn, states that he has not observed the date of arrival of this summer visitor previously, but has noticed it in the neighbourhood of Fairburn as follows:—

1921 August 9th.—Six turtle doves seen feeding on a wheat stubble.

August 20th.—A few turtle doves seen.

August 21st.—A nest was found with two young birds just able to fly.

September 1st.—Three turtle doves seen and the last one was noticed on September 10th.

Mr. E. W. Wade informs me that the species has been distributed all over Holderness since 1918, never numerous, the country generally being too shelterless, but in certain favoured spots a pair was found. It has bred at Warter and in other sheltered valleys on the Wolds as long as the present keeper can remember, but in very restricted numbers. His first acquaintance with this species was in 1906, when he heard two or three pairs in the spinneys in low sheltered valleys. In 1907 it was noticeably spreading over Holderness, where ten years previously it had been entirely unknown. In 1909 he noted that it was still spreading. It was at Brantingham in 1911, and Ferriby, 1912, and here it has remained to date. Around the western edge of the wolds, where the valleys are more sheltered, the turtle dove was settled long before it began to extend into the bleaker country to the east. In 1916 there was a great increase at Warter, and in 1919 forty were seen during the late summer in one flock.

In conclusion, I am led to wonder why the turtle dove has increased in Yorkshire, as these notes have shewn, for, after all, the species is only a summer visitor to our shores, and in the event of some sudden storm overtaking the immigrant flocks, and wiping out those which have our county as their objective, it is quite possible that the turtle dove will again be a rarity in Yorkshire until the cycle adjusts itself by the influence of local breeding of descendants of those pairs which may have escaped the general disaster.

FIELD NOTES.

BIRDS.

Red-necked Grebe near Selby.—On February 4th last, a pair of these Birds was flushed by a local gunner on the Black-Fen; one bird was shot.—J. F. MUSHAM, Selby, Feb. 10th, 1922.

Bulwer's Petrel near Scarborough.—A Bulwer's Petrel (*Bulweria bulweri* J. & S.) was washed ashore at Scalby Mills on February 28th, 1908. It was found by Mr. A. W. Linfoot, who, in spite of its somewhat bad condition, managed to preserve and set up the bird, and he has recently very kindly presented it to the Yorkshire Museum.* We have a further specimen obtained at Tanfield in 1837.—WALTER E. COLLINGE.

Rare Birds in East Yorks.—I was recently visiting a cottage in a remote corner of the East Riding, and I was surprised to find that, in a very restricted area, the following birds, amongst others, had been taken by the occupant, within very recent times:—Montagu's Harrier, Peregrine, Black Tern, Dotterel, Great Crested Grebe, Great Grey Shrike, Little Owl, Hoopoe, Stone Curlew, Little Auk.—CHAS. F. PROCTER, Hull, Feb. 18th, 1922.

Bird Notes from Huddersfield.—The prolonged spell of severe frost at the end of January and early February was responsible for some unusual movements among birds. The usually shy Hedge Accentor was driven to feeding in the streets of the town along with the House Sparrow. On January 22nd my children reported having seen a strange bird in the garden. I did not see it that day, but fortunately it frequently came during the day following. Its build and antics determined it at once as a Tit, and its size was midway between the Blue Tit and Oxeye. Its colouring resembled that of the Marsh Tit, but it had a pronounced pale streak over the crown from the base of the bill down the back of the head. Possibly it was a foreign 'escape.' On February 12th, a Fieldfare visited the food-table in my garden (which is quite in a populous part of the town). Directly the frost broke, Robins, Sparrows, and other common birds, began mating.—CHARLES MOSLEY, Huddersfield.

* *i.e.*, The Museum, York, as the name properly appears on that museum's note-paper. Dr. Collinge refuses to allow this note to appear unless the name 'Yorkshire Museum' is given. His may have been a 'Yorkshire' Museum a century or so ago, but to-day other museums in the county cause the name 'York' Museum to be more accurate and desirable.—ED.

PLANT GALLS FROM SELBY AND YORK.

WILLIAM FALCONER, F.E.S.

THE list given below contains the names of the plant galls noticed on August 1st and 2nd of last year on the occasion of the Union Meeting at York. The writer, detouring at Selby, proceeded up the left bank of the Ouse, along the Bubwith road, and across the Common to Skipwith, and spent the next day alone on Askham Bog. Unfortunately a thunder-storm, accompanied by torrential rain, brought the search in the latter place to a premature end, just when it seemed most profitable. The long undisturbed condition, and the great wealth and variety of the vegetation along the routes traversed, greatly favoured the presence and productions of the various gall agents, and some very noteworthy species were met with. Amongst them may be cited *Lipara lucens* Mgn., new to the north of England; four dipterous galls on sedges, new to Yorkshire; the unnamed mite galls in Houard's Zoocécidies, S. 53 and S. 59; *Xestophanes potentillae* Retz., *Perrisia populeti* Rubs, *Rhopalomyia tanaceticola* Krsk.; and a Psyllid on *Galium cruciata*.

HYMENOPTERA.

- Pontania proxima* Lepel. The common leaf 'bean' gall, plentiful throughout on *Salix alba*, *cinerea*, *fragilis*, and *caprea*.
P. salicis Christ. On *S. repens*, Skipwith Common. Mr. F. A. Mason also brought in specimens.
P. viminalis Htg. On *S. cinerea*, on the Bubwith Road.
Cryptocampus saliceti Fall. On *S. cinerea*, Bubwith Road.
C. ater Jur. On *S. caprea*, Askham Bog.

The following on oak on Skipwith Common :—

- (1) early stages of *Neuroterus lenticularis* Oliv., *N. laeviusculus* Schr., *N. numismatis* Oliv., *Andricus ostreus* Gir., and *Dryophanta divisa* Htg.
- (2) mature and emerging, *D. agama* Htg.
- (3) new, *Cynips kollari* Htg.
- (4) old remains, *N. baccharum* Linn.

- Xestophanes potentillae* Retz. On creeping cinquefoil, on the river bank close to Selby.
Rhodites rosae Linn. On wild rose, many examples by roadside, en route to Askham Bog.

DIPTERA.

- Lipara lucens* Mgn. On *Phragmites communis*, several specimens in one particular spot in Askham Bog; probably in other parts of the bog where the dwarfed plants are more concealed. It is a local species anywhere, and has not hitherto been noted in the N. of England
Mayetiola ventricola Rüb. On *Molinia*, Skipwith Common and Askham Bog, plentiful.
Dichrona gallarum Rüb., *Pseudhormomyia granifex* Kieff., *Hormomyia kneucheri* Kieff., Houard No. 377; *Dishormomyia cornifex* Kieff., all at the base of sedge stems, most of the plants past fruiting and unrecognisable specifically, except *C. hirta* Linn., and *C. goodenovii* Gay; Askham Bog. The flies of the second emerged within a fortnight.

- Perrisia marginem-torquens* Winn. On various long-leaved willows on the river bank above Selby.
- Rhabdophaga terminalis* H. Löw. On *S. fragilis*, river bank above Selby. On *S. fragilis* and *alba*, Askham Bog.
- R. rosaria* H. Löw. On *S. alba*, Askham Bog.
- R. salicis* Schrk. On *S. cinerea* × *repens*, Askham Bog.
- Iteomyia capreae* Linn. On *S. cinerea*, on the Bubwith Road and Askham Bog.
- I. capreae* Linn. var. *major* Kieff. On the same in the same places, but sparsely.
- Perrisia populeti* Rübs. On two young saplings of aspen in Askham Bog.
- P. urticae* Perr. On common nettle, en route to Askham Bog.
- P. tortrix* H. Löw. On a hedgerow bush of *Prunus domestica*, garden at the corner of the road to Tadcaster in plenty.
- P. ulmariae* Bremi. In plenty, and *P. pustulans* Rübs. in much less quantity, both on meadow sweet, Askham Bog.
- P. plicatrix* H. Löw. On brambles, commonly throughout both routes.
- P. crataegi* Winn. On hawthorn, abundant everywhere.
- P. viciae* Kieff. On *Vicia cracca*, river bank above Selby, and Askham Bog.
- P. lathyri* Kieff and *P. lathyricola* Rübs. On meadow vetchling, as the last.
- P. loticola* Rübs. On marsh lotus. Several places on Skipwith Common and Askham Bog.
- Macrolabis corrugans* F. Löw. On hogweed, en route to Askham Bog.
- Perrisia fraxini* Kieff. and *P. fraxinea* Kieff. On ash, on the river bank above Selby.
- P. hygrophila* Mik. On marsh bedstraw, Askham Bog, abundantly.
- Urophora solstitialis* Linn. On black knapweed, river bank above Selby.
- Rhopalomyia millefolii* H. Löw. On yarrow, as the last.
- R. tanaceticola* Krsk. On tansy, approach to Skipwith Common by the bye-road from the Bubwith Road, close to the farm. It occurs freely in several localities about Huddersfield.

HOMOPTERA.

- Livia juncorum* Latr. On rushes at Askham Bog, in plenty, but noted on the previous Saturday by other members of the Union (Dr. Pearsall).
- Pemphigus affinis* Kalt. On black poplar, river bank above Selby.
- Schizoneura ulmi* Linn. On both species of elm, York district, common and abundant.
- Aphis atriplicis* Linn. On *Atriplex patula* and white goosefoot, river banks above Selby, the latter in a tilled field.
- A. padi* Linn. On blackthorn, en route to Askham Bog.
- Hyalopterus pruni* Fabr. On hedge *Prunus*, as last.
- Myzus oxyacanthae* Koch. On crab apple, river bank above Selby.
- Psyllopsis fraxini* Linn. On ash, as last.
- Psyllid* spec. Houard No. 5313. On *Galium cruciata*, river bank above Selby.

ACARI.

- Eriophyes galii* Karp. On goosegrass, river bank above Selby. The following all occurred in Askham Bog, *E. tenuis* Nal., on a grass; *E. brevitarsus* Fckn., *E. nalepai* Fckn., and *E. spec.* Houard No. 1135, on alder; *E. pyri* Pgnst. and *E. goniothorax* Nal., on hawthorn; *E. tetanothrix* and *salicis* Nal., on *Salix cinerea*; *E. spec.* Houard S. 53 and *E. spec.* Houard S. 59, on *S. alba*; *E. macrochelus* Nal., on sycamore; *E. varius* Nal., on aspen.

EELWORM.

- Tylenchus* spec. On stems, *Pimpinella magna*, river bank above Selby.

THE INSECTS OF MARTIN BECK, NOTTS.

J. W. CARR, M.A., F.L.S.

MARTIN BECK WOOD, through which runs the boundary between Yorkshire and Nottinghamshire, was visited by the Yorkshire Naturalists' Union on June 19th, 1920, and an account of the Excursion appeared in *The Naturalist* for August of that year.

The entomology of the Nottinghamshire portion of the wood was investigated by a Nottingham contingent consisting of the Rev. A. Thornley, Dr. D. Hunter, and the writer, and a list of the Insects captured is appended. Coleoptera were very scarce, and nothing of importance was taken. Among the few Ichneumons collected, the unique male of *Mesoleius ustulatus* is of special interest. Diptera were more abundant, and several of these were new records for Notts., e.g. *Hybos grossipes* (common by the pond). *Rhamphomyia gibba*, *Norellia spinigera* and *Sciomyza brevipennis*.

All the Odonata, Neuroptera (except *Coniopteryx*), and Trichoptera recorded by Mr. Porritt in the published report were also taken by us on the Notts. side, and are therefore not repeated here.

I am indebted to Messrs. Claude Morley, F. W. Edwards, and J. E. Collin for assistance in identifying obscure species: a number of small Diptera are still undetermined.

HYMENOPTERA.

TENTHREDINIDAE.

<i>Selandria stramineipes</i> Klug.	<i>Tenthredella livida</i> L.
<i>Taxonus agrorum</i> Fall.	<i>Tenthredopsis palmata</i> Geoffr.

ICHNEUMONIDAE.

<i>Cratichneumon annulator</i> Fab.	<i>Microcryptus abdominator</i> Grav.
<i>Amblyteles armatorius</i> Forst.	<i>Pimpla detrita</i> Holmgr.
<i>Alloplasta murina</i> Grav.	
<i>Mesoleius ustulatus</i> Desv., ♂. This species was described by Desvignes in 1856 from a single female in the British Museum. No other specimen was known until I took the male at Martin Beck.	
<i>Lathrolestes unguularis</i> Thoms.	<i>Porizon harpurus</i> Schr.

ACULEATA.

<i>Myrmica sulcinodis</i> Nyl.	<i>Pemphredon lethifer</i> Shuck.
<i>Crabro tibialis</i> Fab.	<i>Andrena minutula</i> Kirb.
<i>Passaloecus gracilis</i> Curt.	<i>A. wilkella</i> Kirb.
<i>Nomada ochrostoma</i> Kirb., common with its host, <i>A. wilkella</i> .	

DIPTERA.

<i>Bolitophila hybrida</i> Mg.	<i>Ochlerotatus maculatus</i> Mg.
<i>Dixa laeta</i> Lw.?	<i>Limnophila aperta</i> Verr.
<i>Rhamphidia inornata</i> Mg.	<i>Leptis lineola</i> Fab.
<i>Simulium equinum</i> L.	<i>Thereva nobilitata</i> Fab.
<i>Dysmachus trigonus</i> Mg., rather common on bare ground.	

DIPTERA.

Dioctria rufipes De G.

D. atricapilla Mg., both sexes common, clinging to the stems of *Aira flexuosa*.

Hybos grossipes L.

Rhamphomyia gibba Flin.

R. longipes Mg.

Empis aestiva Lw.

E. tessellata Fab.

Hilara interstincta Flin.

H. quadrivittata Mg.

Sylopus contristans Wied.

Syrphus guttatus Flin. A fine ♀ of this rare species taken by Dr. Hunter : the second Nottinghamshire specimen.

S. venustus Mg.

Volucella bombylans L.

V. pellucens L.

Eristalis horticola De G.

Bucentes geniculata De G.

Sarcophaga carnaria L.

Calliphora erythrocephala Mg.

Morellia hortorum Flin.

Polietes lardaria Fab.

Phaonia basalis Zett.

Hebecnema umbratica Mg.

Mydaea duplicata Mg.

M. depuncta Flin.

M. impuncta Flin.

M. duplaris Zett.

Hydrotaea dentipes Fab.

H. irritans Flin.

H. meteorica L.

Fannia aerea Mg.

Dolichopus unguatus L.

Pipunculus fuscipes Zett.

Verrallia aucta Flin.

Chilosia albitarsis Mg.

C. longula Zett.

Platychirus peltatus Mg.

Leucozona lucorum L.

Fannia armata Mg.

F. serena Flin.

Hydrophoria conica Wied.

Hylemyia strigosa Fab.

Chortophila dissecta Mg.

C. trichodactyla Rond.

Anthomyia aestiva Mg.

Coenosia rufipalpis Mg.

C. tigrina Fab.

Norellia spinigera Zett.

Sciomyza brevipennis Zett.

Tetanocera elata Fab.

Sapromyza vorida Flin.

Lauxania aenea Flin.

Palloptera trimacula Mg.

Trypeta cylindrica Desv.

Sepsis cynipsea L.

Ochthiphila polystigma Mg.

HEMIPTERA.

Phylus palliceps Fieb.

Limotettix sulphurella Zett.

Cixius nervosus L.

COLEOPTERA.

Stenus declaratus Er.

Silpha thoracica L.

Coccinella 7-punctata L.

Halyzia 14-guttata L.

Brachypterus urticae F.

Athous haemorrhoidalis F.

Telephorus lividus L.

T. nigricans Müll.

T. bicolor F., comon.

Rhagonycha pallida F.

Malachijs bipustulatus L.

Luperus flavipes L.

Rhynchites nanus Payk.

Deporaus betulae L.

Apion humile Germ.

Strophosomus coryli F., abundant.

Polydrusus cervinus L.

Phyllobius calcaratus F.

P. pyri L.

P. maculicornis Germ.

P. viridiaeris Laich.

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What is described as 'An interesting relic, believed to be part of the standard pole borne at the Battle of Bannockburn in 1314,' has been given to Arbroath Museum. It would be interesting to know what possible evidence there is of such a statement:

A Museum has recently been opened at Hartlepool, thus following the example of its neighbour, West Hartlepool. At present the museum appears to be under the wing of the Library, but no doubt as the town progresses this state of things will be improved upon.

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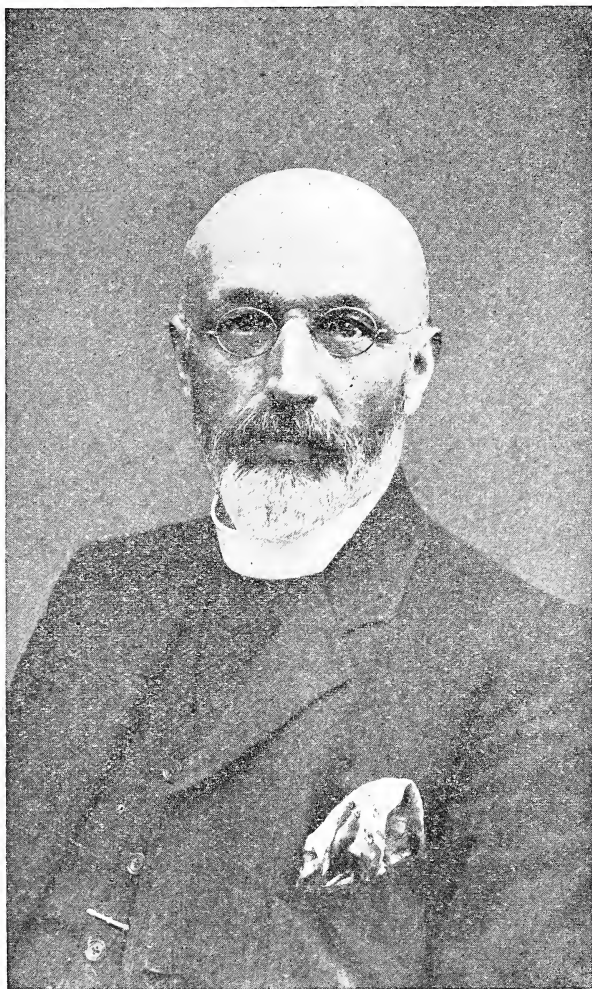
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(To be continued).

In Memoriam.

REV. E. A. WOODRUFFE-PEACOCK.

We regret to announce the death of the Rev. E. Adrian



Woodruffe-Peacock, L.Th., F.L.S., F.G.S., which occurred at Grayingham Rectory, at midnight, on the 3rd February.

Mr. Peacock was a man of many attainments and activities, but he was best known as a capable and experienced field naturalist. He will be greatly missed, particularly by those who are interested in the natural history of Lincolnshire,

for he accomplished probably more than any other single worker in the accumulation of facts relating to the distribution of plants and animals in the county in which he was born, and in which he spent the greater part of his life. He was one of the founders of the Lincolnshire Naturalists' Union in 1893; for ten years he was its Organizing Secretary; he was its President in 1905-6; during the entire period of its existence he has been its moving spirit, and he was once aptly described by the late Canon William Fowler as its 'nursing father.' He was an all-round naturalist. Full of enthusiasm himself, he inspired enthusiasm in others, and he was ever ready to help and encourage fellow-workers and junior students. From his youth up he was an indefatigable observer and note-taker—'a humble recorder of trifling every-day facts' is the description he gave of himself in the preface to his 'Check-List of Lincolnshire Plants,' published in 1909.

Phanerogamic Botany was his special study, and he devoted the leisure of many years to the compilation of a Flora on ecological lines. Mr. A. G. Tansley, F.R.S., of Cambridge, was so much impressed by a perusal of the MS. of this Flora that he offered to bear the expense of its publication. 'It carries out,' he wrote, 'the centre thought of ecology. You go for twenty or thirty years to work the same bit of ground annually to discover its changes. As you are willing to sacrifice any time to get at the facts, you have discovered the obscure laws lying behind them.' This offer was a great encouragement to Mr. Peacock, who, so long as health permitted, was engaged in making a final revision of his MS. for the press. The Flora has been left to the University of Cambridge.

Mr. Peacock was thorough in everything he undertook. In his preaching he always made it his aim to get a series of correlated ideas for every address, and he then endeavoured to give expression to his thoughts in plain, simple, forcible language.

He was the eldest son of the well-known antiquary, Edward Peacock, F.S.A., of Bottesford Manor. He was born there on the 23rd July, 1858, and was educated first at Edinburgh Academy, then at St. John's College, Cambridge, and at Bishop Hatfield's Hall, Durham, where he took the degree of L.Th. in 1880. After holding curacies at Long Benton, Barkingside and Harrington, he became Vicar of Cadney in 1891, remaining there until 1920, when he was appointed Rector of Grayingham. He contributed many articles on natural history topics to scientific journals and to the press, as readers of *The Naturalist* are well aware, and he wrote a number of pamphlets on the relations of

particular grasses to particular soils. He is survived by a widow and three sons.—R.W.G.

We are indebted to the Editors of *The Transactions of the Lincolnshire Naturalists' Union* for the loan of the accompanying block.

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THOMAS AUDAS, L.D.S.

WE much regret to record the death of Mr. Thomas Audas, of Hull and Bridlington, in his 70th year. Though not a voluminous writer, Mr. Audas was a keen and sincere student



of natural history, and upon any subject in which he was interested his information could be depended.

All his life his out-of-door hobbies occupied much of his spare time, and in the summer his week-ends were usually spent in walking around the various districts he knew so well. He was a familiar figure on the Bempton Cliffs, had a particularly intimate knowledge of the bird-life there, and was successful in securing a particularly fine series of their eggs. He was a distinctly scientific collector, and took a pride in the fact that most of the eggs in his collection had been taken by his own hands, in addition to which he was satisfied when a particular species was represented by one clutch in his cabinet. He frequently took journeys (sometimes occupying several days) to remote parts of the British Islands, with the object of securing some rare egg for his series.

He was a recognised authority in the East Riding on its mammals and birds. He also took a keen interest in antlers and horns of foreign mammals, and with the assistance of one

of his sons, who has travelled in different parts of the world, gathered together a fine private collection of these, and also sent many valuable examples to the Hull Museum.

In the old days of the Hull Literary and Philosophical Society, Mr. Audas played a prominent part. He acted as Hon. Curator for several years, and when the present writer took charge of that Society's collections over twenty years ago, he well remembers the large, boldly-written labels (albeit age and dust had not improved them) on hundreds of the specimens, every one of which had been written by Mr. Audas somewhere about half a century ago. He was for many years the Secretary of the Society, and organised the popular Saturday afternoon penny lectures, which were such an important feature of the Society's work, but which unfortunately were allowed to lapse when Mr. Audas gave up his secretary-ship.

So long ago as 1896 Mr. Audas compiled a 'Catalogue of the Pease Collection of Birds in the Museum of the Literary and Philosophical Society,' and *The Transactions of the Hull Scientific and Field Naturalists' Club* contain notes from him, including an admirable paper on 'Local Wild-duck Decoys.'

He took a lively interest in the affairs of this Hull Society, and was President during the years 1900 and 1902. He was well known and respected by all classes in Hull and district, and his loss is a serious one to local natural history. Mr. Audas was a native of Lincolnshire. He leaves a widow, a daughter, and three sons, to whom we extend every sympathy.
—T.S.

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The Conservation of the Wild Life of Canada. By C. Gordon Hewitt, D.Sc. New York: Charles Scribner's Sons, xx.+343 pp. The Canadian National Parks Branch of the Department of the Interior, Ottawa, is to be congratulated on the production of the above monumental work on conservation, under the distinguished authorship of the late Dr. C. Gordon Hewitt. Although ten years of life in office were his lot in which to study the greatly diversified and still abundant fauna of Canada, the work is remarkable in so far as it deals with almost every type of animal life to be found in the foothill, mountain and plain. Conservation is, of course, the principal theme of the book, and fortunately, owing to the customary foresight of the Canadian Government in following the advice of its officials, the animal species that were in danger of becoming extinct a few years ago are now being preserved in the natural parks and enclosures. The history of the buffalo in Canada, as presented by the author, reads as a romance, and their destruction in millions before the advent of human settlers is almost unbelievable. In the words of the author 'the vast herds seemed to clothe the prairies in a coat of brown. They were as thick as the leaves in the forest. These countless herds greeted the advance guards of civilisation, and that process spelled their doom.' The work is beautifully illustrated throughout by excellent photographs and text figures; Plate V., showing a herd of caribou in the North-west Territories, is probably the most striking animal photograph ever taken in Canada. There is a good index, and the work is supplied with the right number of distribution-maps and statistics.—G.S.

YORKSHIRE NATURALISTS' UNION : BOTANICAL SECTION.

THIS section met on February 11th, and is again indebted to Prof. Priestley and the authorities of the Leeds University for the use of the rooms there, and also to Mrs. Priestley and Mrs. Grist for the very welcome tea they provided.

Prof. Priestley, in the chair, gave a hearty welcome to Dr. T. W. Woodhead at this, the first meeting during his year of office as President.

Mr. J. W. H. Johnson's paper, dealing with the influence of last summer's drought on the selection of flowers by honey bees, commenced with general details of their work among nectar, pollen and propolis. Then a description of the variation of honey during a normal season, from the limpid clover honey to the stiffer honey later in the year. Maximum production is found during warm, muggy weather. Nectar is lacking in dry times and washed out in wet, and the bees do not work in heavy rain. In 1920, the saturated soil of January and February persisted, more or less, into late summer; but in 1921 the ground quickly dried, and the flowering seasons of the various plants were intense, but short. The heavy rain of August helped the flowering of the labiates of this part of the year, and produced a type of honey flavoured with mint, a fact noted from widely separated districts.

Dr. Woodhead and Miss Bates dealt with the same area of moors near Marsden, the first dealing with flints from under the peat, and mentioning very interesting finds by Mr. Buckley, of Greenfield, and others; Miss Bates taking the subject of buried timber.

Mr. F. E. Milsom gave a resumé of the many theories on the subject of Oil Bodies of Liverworts. These highly refractive bodies, so characteristic of the cells of *Alicularia scalaris* as to be deemed a useful character in determining species, are in very varied size, form and number present in the tissues of many Liverworts.

The suggestions of earlier workers as to their formation were:—

- (1) By the union of many small oil drops in the cell. Pfeffer, 1874.
- (2) By the formation in elaioplasts. Wakker, 1888.
- (3) Oil is distributed throughout a protein stroma. v. Kuster, 1894.
- (4) Garjeanne (1903) showed they originate in very young cells at the growing point, by the secretion of oil in vacuoles, probably in a semi-fluid matrix, separated from the cell sap by a living protoplasmic wall; once formed, the oil bodies persist until the death of the cell, a fact that suggested an excretory substance in contradistinction to the elaioplasts, which are metamorphosed chlorophyll grains and are reabsorbed.

The chemical composition appears to be a fatty oil associated frequently with an essential oil. Mr. Milsom showed photomicrographs of the oil bodies in *Alicularia scalaris*, and a sample of viscid dark-coloured oil extracted from this plant.

Dr. Pearsall dealt with the change of wood type by a change of habitat; starting with a limestone area, and taking the head of a stream with steep cliffs and scree with a shrub growth, to a more open type, as Ling Ghyll, where the soil is more modified, and the wood is some 60% Elm, 30% Ash; next, the broader valley, as the lower part of Thornton Ghyll, Ingleton, where 50% Ash, 20% Elm and 20 to 40% Oak is found, and from this gradually to where Oak becomes the chief factor.

Dr. Ewing's paper on an indigenous Pine forest of North Scotland supplemented the previous communication. He showed clearly how Calluna under Pines stopped the development of seedling pines, and also how the pine wood developed through lichens and mosses on a bare stone area.

Mr. Sheppard's communication, dealing with recent records of birds, etc., will appear in these pages, and adds another interesting chapter to the story of Yorkshire peat.—CHRIS. A. CHEETHAM.

VERTEBRATE ZOOLOGY IN YORKSHIRE.

A MEETING of the Vertebrate Section of the Yorkshire Naturalists' Union was held at Leeds on February 18th, Mr. S. H. Smith presiding.

The Sectional Meeting was preceded by a Meeting of the Yorkshire Wild Birds and Eggs Protection Acts Committee, Mr. H. B. Booth taking the Chair.

Mr. C. F. Procter gave a paper on 'The Pine Marten,' and said that owing to its destructive habits this animal had suffered very severely at the hands of the game-preserve, and was now very rarely reported in the County. It once had a very wide range in Europe, where its place was now occupied by the Beech Marten, but it was still plentiful in North America. In the British Isles it was still found in the Lake District, Westmorland, Wales, Scotland and Ireland, perhaps also in North-west Yorkshire.

The lecturer exhibited a stuffed specimen which was killed on the 1st of June last, at Barmston, in Holderness. Last May the gamekeeper in that neighbourhood found many dead rabbits on his rounds, and some creature entered his hen-house and killed 14 pullets. It then frequented a bank riddled with rabbit holes and was eventually caught in a trap set in an artificial tunnel through the bank.

Mr. H. Pollard gave 'Spring Notes among the Birds of Lapland,' illustrated by lantern slides.

The lecturer arrived at Kiruna on June 2nd. A nest of the Rough-legged Buzzard was found in a rocky gully, and many interesting species of birds were nesting in the swamps, including the lesser White Fronted Goose, Bean Goose, Spotted Redshank, Red Spotted Bluethroat, Lapland Bunting and Grey Headed Yellow Wagtail. The Mealy Redpoll and Redwing also nested in the district.

On June 7th, the lecturer left for Gellivari, on the way, near Karasundo, Temminck's Stint, Ruffs, Pintail, Wigeon, Teal and the Short-eared Owl were encountered. The next stage of the journey was up the Muonio Elf, the river forming the boundary between Russia and Sweden. Near Maunu several nests of the Pine Grosbeak were found, besides those of the Whimbrel, Ring Plover, Red Spotted Bluethroat, Wood Sandpiper, Lapland Bunting, Red Necked Phalarope, and Hen Harrier. An unavailing search was here made for the Bar Tailed Godwit, but nests of the Dotterel, Buffon's Skua and Shore Lark were found and the Willow Grouse seen. Many species of duck were flying about, and these the natives shot at every opportunity. On the return journey the Long Tailed Duck and Snow Bunting were added to the list, and a young Crane in down was caught and sent to the British Museum. The lantern slides gave an excellent idea of the country, and showed the nests of many of the species encountered.

At the evening Meeting, Dr. Collinge gave a paper on 'The Economic Status of Wild Birds,' illustrated by many diagrammatic lantern slides. The lecturer stated that during the last ten years this subject had attracted more than usual attention, and during the war we had been face to face with the problem of maintaining ourselves on home grown food. The feeding habits of wild birds were of the greatest importance from this point of view. The problem of rightly estimating the economic status of a wild bird was not an easy one, and entailed careful and detailed research. Most of our wild birds are beneficial, and only a very few species are injurious; these latter may be controlled and their injurious effects materially lessened by suitable repressive measures.

The lecturer dealt with the method of estimating the food contents of the stomachs of wild birds, and gave his reasons for adopting the volumetric method or percentage by bulk.

The stomach contents of the Song Thrush were found to average 84 insects, which were digested in three to four hours, showing that about 336 insects are consumed by one bird in an average day, except during the

nesting months, April, May and June, when the number is greatly exceeded.

It follows that in the three months named, each Song Thrush accounts for at least 30,000 insects, most of which are harmful to the farmer and fruit grower. When one considers what the cumulative effect of the feeding habits of this species alone must mean to the farmer and fruit grower, in preventing the destruction of thousands of pounds' worth of food, one realises what must be the total effect for good of the 50 or 60 species of insect-feeding birds. Without their aid it would be impossible to cultivate the land to any profitable purpose.

Once the people of this country realise what a potent factor wild birds are in the protection of our food crops and forests, then more enlightened views will prevail, and the tardy Machinery of the State will be forced to move more quickly and more effectively in order to preserve and protect a natural force of inestimable value to mankind.

Mr. Chislett read a paper on 'The Hooded Crow and Whimbrel in their Breeding Haunts,' illustrated by beautiful photographs obtained by him in Shetland.

The lecturer found the Hooded Crows plentiful, nesting chiefly in the cliffs, though one nest was found in the ruins of a cottage. The nest is usually composed of seaweed lined with Shetland wool, but this one had added a number of bones and wings of birds; they obtained their food principally on the shore, and were wary and difficult to photograph.

The lecturer believed himself to be the first to photograph the Whimbrel on its nest. This nest was found almost by accident after a long and fruitless search. Many slides were shown of the birds and eggs and also of the chicks. The call is supposed to be seven times repeated; hence the name of 'Seven Whistler.' In this instance the number of repetitions was very variable and averaged about nine. After the young were hatched they were led away by their parents into deep heather and were very difficult to locate.—E. WILFRED TAYLOR.

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CORRESPONDENCE.

POISONOUS EFFECT OF HAY.

One of my uncles informs me that hay put into water frequented by pike (about June or July) has a poisonous effect on the fish, and he stated he had seen dead pike after a flood had washed hay into their habitat.—W. G. BRAMLEY.

ROOK SUPERSTITION.

The presence of a bird of ill-omen at Moldgreen, near Huddersfield, has been reported to me to-day (Jan. 28th). It is described as a particularly large and exceedingly ugly black 'crow' (rook?), which has haunted the neighbourhood for some weeks, to the horror of certain of the residents. So large is it (in their fancy) that it darkens a room should it chance to fly past a window! But worse than that—this ugly monster leaves death in its train, and many persons are known to have passed away within a few days after the bird crossed over their house in its flight!! It has frequently been seen in the neighbourhood of the house of my informant, and since one member of the family is an invalid, they have been living in perpetual fear and trembling lest death should enter their home. This particular bird seems to be an outcast from its kindred, and is said to be always alone. The superstition is firmly rooted, and an attempt to explain it away was only met by the remark 'I wish someone would shoot it.' The party so concerned has now removed to another part of England, whence, let us hope, this ugly 'crow' will not follow.—CHARLES MOSLEY, Huddersfield.

NORTHERN NEWS.

Prof. A. C. Seward, F.R.S., has been elected to the Presidency of the Geological Society of London.

The late Colonel E. S. Mason's collection of albinos, hybrids, and varieties of birds and mammals has been deposited in the Lincoln Museum.

We gather from the press that a valuable art collection, which recently realised £10,853, left by the late S. Bainbridge, would have been given to the City of Lincoln had there been a suitable building for its reception.

Dr. Hugh Scott has a 'Note on some Hymenopterous Parasites and other enemies of *Tortrix viridana* Linn.; with further Records of Chalcididae swarming in buildings,' in *The Entomologist's Monthly Magazine* for March.

Among the papers in *The Journal of the Ministry of Agriculture* for March we notice 'Potato Pink Rot,' by A. D. Cotton; 'Turnip Gall Weevil,' by P. V. Isaac; and 'Food and Feeding Habits of the Little Owl,' by W. E. Collinge.

We must congratulate Mr. H. Kirke Swann on the prompt issue of his 'Synopsis of the Accipitres.' Part III. has appeared and includes Herpetotheres to Pernis, comprising Species and Subspecies described up to 1920, with their Characters and Distribution.

'Biological Studies in *Aphis rumicis* L.,' by J. Davidson; 'Sources of Infection of Potato Tubers with *Phytophthora infestans*,' by P. A. Murphy; 'Diseases of Flax,' by H. A. Lafferty, are among the numerous valuable papers recently issued by the Royal Dublin Society.

Part XIII. of Witherby's 'Practical Handbook of British Birds' (Vol. II., pp. 353-448, 4/6 net) has appeared, and deals with Eiders, Scoters, Cormorants, Shags, Gannet, Petrels, Shearwaters, Albatros and allied species. There are numerous illustrations of critical parts of birds.

'A New Styelid Tunicate from Norway' is the title of a Monograph, in English, by Dr. A. Ärnäsch-Christie-Linde, in the *Bergens Museums Aarbok*, recently to hand; and there are other valuable papers in English. In the same publication Jens Holmboe contributes 'Lidt om *Monotropa Hypopetys* i Norge.'

Among the papers in *The Journal of Botany* for March are 'Southbya nigrella in Britain,' by W. E. Nicholson; 'Critical Notes on some Species of *Cerastium*,' by F. N. Williams; 'Notes on North Herts Willows,' by J. E. Little; and 'New and Noteworthy Fungi,' by W. B. Groves. There are the usual informative Book-Notes, News, etc.

We learn from a Hull newspaper dated February 24th, that 'A richly marked "scarlet admiral" butterfly was discovered crawling on the floor of a "Mail" room this morning. It had apparently just emerged from its chrysalis, or perhaps had just "blown in." We know these newspaper offices. Is the editor satisfied that it was not a "painted lady" that had just "blown in"?'

Hull Museum Publication No. 125, being the 62nd Record of Additions, has just appeared, though it evidently includes notes written some time ago. The Museum is apparently getting rid of its arrears of records, which have accumulated during the war. The part deals with Relics of Old High Street, Old Hull Steamers, Numismatics, a Model of an Early Type of Railway Engine and other additions.

'Hop-growers' Tokens,' by J. Digby Firth; 'Agriculture and its Effect on the Distribution of Recent Coins,' and 'Check List of Pence of Queen Victoria,' both by J. F. Musham; 'Roman Coins from the Excavations at Ilkley,' by A. M. Woodward; and papers on 'Love Tokens,' 'Yorkshire Tramway Tokens' and 'Yorkshire Seventeenth Century Tokens,' by the Editor, T. Sheppard; and 'An Unpublished Farthing Token in Silver,' by W. J. Davis, appear in the well-illustrated *Transactions of the Yorkshire Numismatic Society* just to hand (A. Brown & Sons, Ltd., Hull, 4s.).

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Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by
A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
April 1st, 1922.

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No. 784

No. 558 of current Series

MAY 1922.

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

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The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
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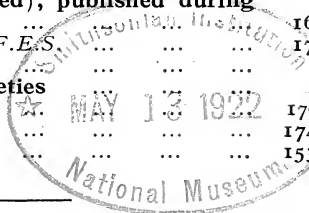
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RILEY FORTUNE, F.Z.S.

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NOTES AND COMMENTS.

INDEX ANIMALIUM.

Sherborn, Charles Davies, 'Index Animalium sive index nominum quae ab A.D. MDCCLVIII. generibus et speciebus animalium impositae sunt. Sectio secunda a Kalendis Januariis MDCCCL. usque ad finem Decembris MDCCCL. Part I. Introduction, Bibliography and Index *A—Aff.*, pp. i.-cxxxii., 1-128, 1801-1850.' London: Printed by order of the Trustees of the British Museum, 1922, 8vo., price 20/-. The work, of which this is a second instalment, is nothing less than a heroic attempt to compile a list of the generic and specific names given to animals since the publication of the tenth edition of the 'Systema Naturæ' of Linnæus (1758). When it is remembered that Mr. Sherborn's method of compiling his index is not to rely upon the work of his predecessors in this field but to start *de novo*, and go through the whole of zoological literature page by page, listing the names of genera and species as he comes across them, it will be seen that the adjective 'heroic' we have applied to the enterprise is fully justified. More than thirty years ago the work was begun, and in 1902 the first section, comprising the names given from 1758 to 1800, was published by the Cambridge University Press. Financial aid has been received from the British Association, the Royal and Zoological Societies and from the British Museum Trustees, who have now assumed all responsibility for its continuance. We are, however, shocked to find that the stipend paid to Mr. Sherborn for this exacting and laborious work amounts to less than the wages of the Lavatory Attendant !

A VALUABLE WORK.

The first section, published twenty years ago, occupied 1254 pages, but it is estimated that several volumes will be required for the completion of the second. After a brief introduction and a short list of *Libri desiderati*, to which we invite the kind attention of all librarians, upwards of one hundred pages are occupied by a closely printed list of the works which have been consulted. Endless pains have been given to the accurate determination of the actual dates of publication of these, especially of serials and works issued in irregular parts. Chronological details are given in all difficult and important cases. Any one who has been unfortunate enough to take part in discussions on priority in nomenclature will fully appreciate the value of this information. To many entries, Mr. Sherborn has thoughtfully appended the letters 'No n.spp.', which, like a board bearing the words 'no road,' will save others from wasting their energy in a fruitless search. Of the index itself, only 128 pages are given in the present fascicule, which extend from 'A' to 'Affinis,' containing about 7000

names; the specific name 'Acuminatus' alone occupying five pages with about 250 names. Any adequate examination of the completeness of such an index is obviously impossible without doing a good deal of the work over again; the present reviewer can only say that it has satisfactorily come through such tests as he has been able to apply. Enough has been said to show that, in view of the efforts now being made by the International Commission on Zoological Nomenclature and many other independent workers to establish the names of animals on a firm and lasting basis, this book is absolutely indispensable in any institution where investigations in Systematic Zoology are being carried on. To attempt any adequate appreciation of Mr. Sherborn's self-sacrificing devotion to his chosen task would be as futile as gratuitous. He has made it his mission in life, and his best reward will be the knowledge that the fruits of his labour are being utilised for the benefit of science.—W.E.H.

BIRDS AND CATTLE DISEASE.

The following Resolution was passed at a Meeting of the Vertebrate Section of the Yorkshire Naturalists' Union, at Leeds, on February 18th. The foot and mouth disease was then at its height, and the view had been expressed in several quarters that the disease was introduced by migratory birds. 'That this Meeting of the Vertebrate Section of the Yorkshire Naturalists' Union thinks that it is most unlikely that the foot and mouth disease epidemic has been introduced into this country by wild birds. So far as they are aware there is no evidence whatever for such a view, and they recommend that the matter be at once referred to the Wild Birds Advisory Committee. Were such a theory correct, one would expect outbreaks of the epidemic in or slightly after September and October, when the winter migrants are arriving.' A copy of this Resolution was forwarded to the Board of Agriculture, and their reply, dated March 25th, is as follows:—

THE BOARD'S REPLY.

'Your Resolution states that were such a theory correct, outbreaks would be expected to occur in, or shortly after, September and October, when the winter migrants are arriving. I am to point out that one of the arguments in favour of the theory that the infection of foot and mouth disease may have been introduced by birds is that outbreaks have, in fact, commenced in the months referred to. For example, after a period of comparative freedom from the disease, outbreaks commenced in Dorsetshire on the 11th September, 1919, and thereafter occurred in Huntingdonshire, Cambridgeshire, the Isle of Wight, Lincolnshire, Lindsey, Kesteven and Surrey, during the months of September, October and November.

Further outbreaks occurred in Durham, West Sussex and Kent, in December of the same year. Again, without any apparent cause, outbreaks commenced in East Sussex on the 23rd August, 1920, and in Kent and Suffolk in the months of October and November. Again in 1914, after a period of freedom, foot and mouth disease commenced at the end of August at Stallingborough (Lincolnshire) and continued until the earlier part of September, and in 1915 after a period of nine months' freedom, foot and mouth disease broke out in Somersetshire on the 20th October, and led to widespread outbreaks of the disease in that county and in the adjoining county of Wiltshire. The Ministry will, however, be very much obliged for any real evidence which the Yorkshire Naturalists' Union is able to furnish against the view that infection may be introduced by wild birds.'

It is not for the Union to furnish evidence that the infection may be introduced by wild birds. The probabilities are greatly against it; not the slightest proof has so far been advanced of the likelihood of such an occurrence. It is for those who have advanced the apparently absurd theory to make good their statements.—R.F.

Will any members of the Union who are able to furnish any evidence bearing upon this question kindly forward the same to the Hon. Secretary of the Vertebrate Section, E. Wilfred Taylor, 10 Telford Terrace, York.?

FADING OF MUSEUM SPECIMENS.

In *The Museums Journal* for April, Sir Sidney F. Harmer, of the British Museum (Natural History), South Kensington, has an elaborate and valuable paper on 'Experiments on the Fading of Museum Specimens,' which should be read by every museum curator and others interested in natural history objects. Sir Sidney's conclusions are:—(a) The additional expenditure which would be involved in glazing windows or the tops and sides of cases with a tinted glass would probably be out of proportion to the slight advantage possessed by any of the glasses at present available in prolonging, but not in preventing, the fading of specimens. (b) Direct sunlight should be avoided at all costs in galleries in which specimens such as Mammals, Birds and Moths are to be exhibited. (c) It should be realized that diffused daylight is also injurious, though to a less extent than direct sunlight, to fugitive colours. The practice, which has been in use for some years, during the summer, in the British Museum (Natural History) of completely darkening the galleries by black blinds, after closing time, is to be strongly recommended. In most museums the specimens are exposed to a large amount of deleterious light in the summer mornings and evenings, during many hours when the galleries

are closed to visitors. At other times the light should be moderated, as by the use of yellow blinds in the windows, whenever the light is at all bright. (d) A gallery without windows, lighted entirely by electric light, preferably not by arc-lights, would have great advantages."

COMMON WEEDS.

During 1921, Dr. W. G. Smith published in *The Scottish Journal of Agriculture* a series of nine chapters on 'Common Weeds.' These have been issued as a reprint, which will be welcomed by all interested in the cultivation and distribution of plants. In a brief introduction, references are given to the more important contributions to the subject, the colonisation of bare land and how weeds reach the land. Descriptions of the common weeds follow, and these are written in clear, simple and interesting language. The arrangement is based on flower colours, yellow, white, red and blue, and greenish flowers, annuals and perennials. A very helpful account is given of weed control and treatment. The work is clearly printed and illustrated by 29 figures of the more important species from the 'Standard Cyclopaedia of Agriculture,' and the works of H. C. Long and W. E. Brenchley.

PRICES OF BUTTERFLIES.

We learn from *The Daily Chronicle* that 'A record price for any British insect was realised during a sale of British butterflies at Stevens' Auction Rooms recently. It was the property of the late A. B. Farn, and a specimen which fetched £32 was a magnificent black variety of the marbled white. Typical specimens of this butterfly are so common that their market value is only about 2d. A remarkable variety of the comma butterfly sold for £21, and a unique white variety of the Painted Lady, £16. [We understand that the White Painted Lady (*V. cardui*) was taken at Boynton, Yorks., August, 1888, by Rev. G. M. Smith]. For a silvery specimen of the high brown fritillary £20 was paid, and a black form of the silver washed fritillary was knocked down at £17. Seeing that all the species mentioned, with the exception of the comma, are common in this country, the prices realised indicate how advantageous it is for collectors to keep a sharp look-out for varieties.'

—: o :—

Large Yorkshire Pike.—On March 3rd, a Pike, weighing 24 lbs., was caught by Mr. A. Roberts, of Middleham, in the River Ure, in a locality known as 'The Deeps,' below Middleham. It was a cock fish, in fine condition, measuring 43½ inches.—R. FORTUNE.

WILLIAM FOTHERGILL (G).

b. 1748. *d.* 1837.



From a silhouette.

CHARLES FOTHERGILL (H).

b. 1782. *d.* 1841.



“ Charles Fothergill, aged 18,
painted 1801, by E.F.,” his sister,
Eliza Fothergill.

JOHN FOTHERGILL (I).

b. 1785. *d.* 1858.



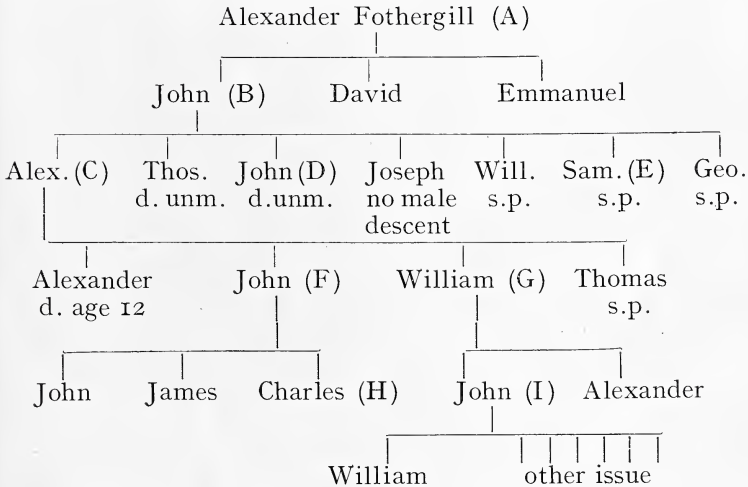
From a daguerreotype taken
about 1856.

THE FOTHERGILL FAMILY AS ORNITHOLOGISTS.

HUGH S. GLADSTONE,

MY attention has only recently been drawn to a list of Birds, given in Whitaker's *History of Richmondshire*,* for which the author 'acknowledges his obligations to Mr. Fothergill, an ingenious surgeon at Askrig.'

I have had considerable difficulty in identifying this 'Mr. Fothergill,' and I must here express my indebtedness to Mr. Bernard Thistlethwaite, the Author of *The Thistlethwaite Family*,† who has given me much help. He has also referred me to his account, in the above-mentioned genealogy, of the descendants of Alexander Fothergill, farmer and lawyer, of Carr End, near Bainbridge, Wensleydale, Yorkshire, by his wife Margaret Thistlethwaite. Among their descendants is not only the 'ingenious surgeon at Askrig,' but also the naturalist, Charles Fothergill. I must thank Mr. W. S. Fothergill and Dr. W. E. Fothergill, grandsons of John Fothergill, for the material assistance they have given me, and also Mr. Watson Fothergill, grand-nephew of Charles Fothergill, for his kindly help : Dr. Hingston Fox, the author of *Doctor John Fothergill and his friends*, has, moreover, rendered me considerable assistance. As the questions to be propounded are somewhat intricate, the following skeleton pedigree of the male descendants of Alexander Fothergill will, it is hoped, make them readily clear of comprehension :—



* Thomas Dunham Whitaker: *An History of Richmondshire, in the North Riding of the County of York*. Vol. I. (1823), pp. 415-416.

† Bernard Thistlethwaite: *The Thistlethwaite Family: A Study in Genealogy*. (1910.)

Messrs. Mullens and Kirke Swann, in their *Bibliography of British Ornithology* (1917), dealing with Charles Fothergill (H), say:—‘we really know nothing of his life’: but in Mr. Thistlethwaite’s book very complete biographies both of him and his relations are given, and these show that Messrs. Mullens and Kirke Swann are wrong in such details as they give concerning Charles Fothergill’s genealogy.

Charles Fothergill (H) was born at York, his father being John Fothergill (F), ‘comb-maker’ or ‘ivory manufacturer,’ of York, his mother Mary Ann Forbes, his grandfather Alexander Fothergill (C), lawyer and farmer of Carr End, County York, and his great-grandfather John Fothergill (B), the celebrated Quaker preacher and traveller, of Carr End. The third (*not* second) son of the last named was Dr. John Fothergill (D), the eminent botanist and physician, who had a botanic garden at Upton, West Ham, and who died unmarried in London in 1780, and a sixth son was Samuel Fothergill (E) the ‘travelling Quaker’: Charles Fothergill (H) was therefore grand-nephew (*not* nephew) of Dr. John (D) and of Samuel Fothergill (E), and great-grandson (*not* grandson, as suggested by Messrs. Mullens and Kirke Swann) of John Fothergill (B) of Carr End.

John Fothergill (F) the father of Charles Fothergill (H) had an elder brother Alexander, who died at the age of twelve: a younger brother William (G), and another younger brother Thomas who died unmarried. Although William Fothergill (G) was the second surviving son he succeeded to Carr End, and he it was who carried on correspondence with his nephew (*not* cousin) Charles Fothergill (H). This William Fothergill (G) had a son John (I), whom I have every reason to believe was the ‘ingenious surgeon at Askrig.’

It will be of interest here to quote the biography of Charles Fothergill (H) as given by Mr. Bernard Thistlethwaite:—

‘Charles Fothergill was born on 23rd May, 1782, at York. He was married, firstly, somewhere in England, during the year 1811, to Charlotte Nevins. They were living at Lachfield [? Larchfield], near Leeds, in 1813, and in 1814 at Rockmont, Peel, in the Isle of Man. They emigrated [in July, 1816, in *The William**] to Canada, and she died in Toronto, about 1820, being buried just north of St. James’ Cathedral, Toronto: by her he had issue, three sons. He married, secondly, Eliza Richardson, the eldest daughter of Joshua and Catherine Richardson. She was born at Mount Monerabe, five miles from Mount Rath, Queen’s County, in Ireland, on the 15th February, 1801, and was married to Charles Fothergill at the Parish Church, in Port Hope,

* Mr. Watson Fothergill: *in litt.* 4th May, 1921.

Newcastle District, Upper Canada, by the Rev. William Thompson, Rector of Cavan, on Sunday, 20th March, 1825. She died at Whitby, Ontario, on the 26th December, 1892, and was buried in the Friends' Burial Ground, Pickering, Ontario. Charles Fothergill was a literary man, and established a newspaper in Canada. He was also a celebrated naturalist, and had a very large museum. He died in May, 1841, aged fifty-nine years, and was buried in the Friends' Burial Ground at Pickering, Ontario. By his second wife he had issue two sons and two daughters.* Descendants of Charles Fothergill are still living in Canada, and a grand-nephew resides at Nottingham.

As an ornithologist, Charles Fothergill (H) is the acknowledged Author of *Ornithologia Britannica*, a scarce folio tract of eleven pages, giving a list of 301 birds, with short notes, which was published at York, in 1799, and it is noteworthy that at that time he could only have been seventeen years of age. Such precocity is remarkable, but is not infrequently noticed in young persons of the Quaker persuasion who, dissuaded against the usual sports and pastimes of youth, are early induced to prosecute the Study of Natural History and kindred subjects. Fourteen years later he published in London *An Essay on the Philosophy, Study, and Use of Natural History*, a small octavo volume of 236 pages, with 35 pages of introduction, dedicated to his uncle, James Forbes.† This work contains some references to birds,‡ and is of special interest since the Author reveals some details about himself. He appears to have been an ardent lover of animated nature, and he writes with affection of his spaniels,§ and with contrition at having wounded a Lapwing.|| He tells us:—'in early life, the ardour of my love for the pursuits of *Natural History* was so great, that I overcame many very serious difficulties in order to make myself personally acquainted with the lives and manners of various animals in their native haunts; and, with this view, I spent several years in

* Bernard Thistlethwaite: *The Thistlethwaite Family: A Study in Genealogy*. (1910), pp. 151-152.

† James Forbes was the grandfather of Charles Forbes René, Comte de Montalembert (one of the most distinguished Frenchmen of the nineteenth century), who was therefore first cousin once removed to Charles Fothergill (H). James Forbes was an artist, who died at Aix-la-Chapelle, and his daughter married Marc René, Comte de Montalembert.

‡ The only birds specifically mentioned are the Lapwing, pp. 113-114; Ostrich, pp. 160-168; Swallow, pp. 174-182; House-Martin, p. 177; Sand-Martin, p. 177; Swift, p. 177; Red Grouse, p. 212; Red-breasted Merganser, p. 212; and Eider Duck, pp. 212-214.

§ Charles Fothergill: *An Essay on the Philosophy, Study, and Use of Natural History*. (1813), p. 80.

|| *Loc. cit.* pp. 113-114.

wandering through such parts of Great Britain as were least known.* We learn that he was living 'in the neighbourhood of York a few years ago (1808),'[†] and it may here be added that an allusion, presumably to Charles Fothergill (H), in *Historia Naturalis Orcadensis*[‡] would seem to indicate that in 1806 he resided at Richmond, Yorkshire. Turning again to his *Essay* we find that Charles Fothergill gives the following reason for its publication:—'Having been engaged for many years in studies connected with the Natural History, and especially with the Zoology of Great Britain, I lately quitted my retirement in the country for a temporary residence in London, in order to arrange the numerous papers, containing the result of my researches on these subjects, for publication previous to my departure from England on a distant voyage,'[§] and this may refer to his emigration to Canada in July, 1816. He refers to 'a relative, and intimate friend of mine, Wm. Fothergill, Esq., of Carr-End, in Wensleydale, Yorkshire, who has generally a tame toad in his garden,'^{||} and this reference to his uncle is of no little interest. Charles Fothergill (H) describes himself as 'one who has been accustomed to consider every hour that is not appropriated to profitable thinking, or useful exertion, as lost or misspent,'[¶] and it appears that, in 1813, he was engaged in preparing a series of works for the press:—'the works alluded to are some undertakings of considerable magnitude, which have occupied the attention of the Author for several years. They will form publications entirely independent of each other, though the whole are composed of materials originally intended for one great work; the design of which has been abandoned through necessity rather than inclination. That which is at present in the state of most forwardness is entitled *Memoirs and Illustrations of British Zoology*,[§] containing the result of personal research into the lives, economy, and uses of such general and species of animals as are the least known or understood throughout England, Scotland, and Wales; illustrated by the most accurate representations of many rare subjects not hitherto figured in any work extant.'

(*To be continued*).

* *Loc. cit.* p. 109. † Charles Fothergill: *An Essay on the Philosophy, Study and Use of Natural History* (1813), p. 221.

‡ W. B. Baikie and Robert Heddle: *Historia Naturalis Orcadensis* (1848), pp. 61-62; see also p. 51.

§ Charles Fothergill: *An Essay on the Philosophy, Study and Use of Natural History* (1813), pp. xv.-xvi.

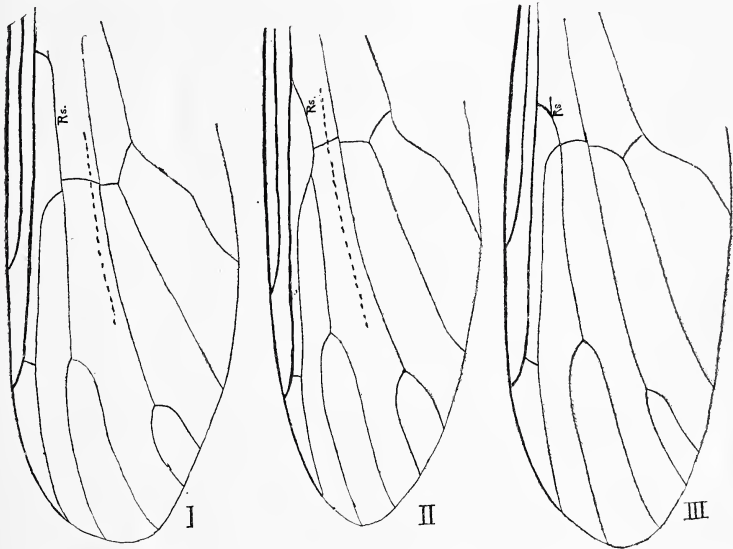
|| *Loc. cit.* p. 194. ¶ *Loc. cit.* p. xxi.

§ Charles Fothergill: *An Essay on the Philosophy, Study and Use of Natural History* (1813), p. 61, where this work is described as 'now in the press.'

YORKSHIRE *PTYCHOPTERA*, INCLUDING
P. LONGICAUDA, NEW TO THE BRITISH LIST.

CHRIS. A. CHEETHAM.

IN Verrall's List of British Diptera, 1901, there are five species of *Ptychoptera*, and keys to the same species are given in Wingate's Durham Diptera, all of which have been recorded for our county. Recently M. Tonnoir* described two additional species, one of which, *P. minuta* Tonn. has been found



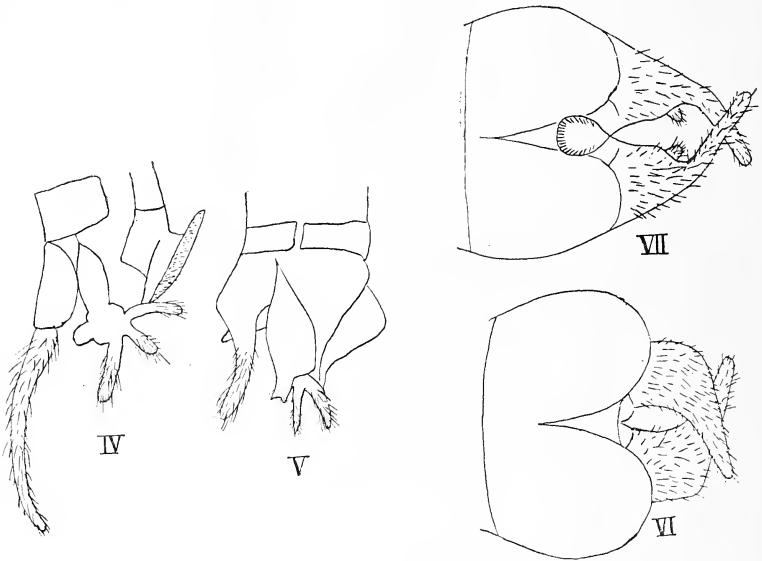
in several places in Britain. Mr. F. W. Edwards, who identified this species for me, and brought M. Tonnoir's paper to my notice, cites: Spey Bridge, Nethy Bridge and Aviemore, Inverness (Yerbury), Lyndhurst, Hants (Yerbury), Hitchen, Herts. (F.W.E.), Notts. (Carr). In addition to Austwick, where it is recorded from in the list in *Nat.*, 1921, p. 410. I have taken it at Gormire, and seen a specimen taken by Mr. G. T. Porritt at Hornsea.

Tonnoir's other species, *P. longicauda*, has not yet been recorded for Britain. I find, however, that I took a ♂ of this species at Mickley Woods last August. With this, all the British species have been found in Yorkshire. I have collected all but *paludosa* Mg. (*Nat.*, 1908, p. 104), and in working over the genus with Wingate's keys, had difficulty

* 'Annales de la Société Entomologique de Belgique.' lix., 1919, pp. 115-122.

at times, with the meta-tarsal colour character, and found the venation, which he does not use, very helpful ; here the species fall into three groups :—

- I. Where Rs (the common base of Wingate's V2 and V3) is long=*contaminata* L.
- II. Rs medium length=*albimana* F., *scutellaris* Mg., *minuta* Tonn.
- III. Rs short=*lacustris* Mg., *paludosa* Mg., *longicauda* Tonn.



The spotted wings differentiate *albimana* from *scutellaris* and *minuta*, and these two last are identified by the appearance of the ♂ genitalia as seen from above ; in *scutellaris* the anal opening is visible above as VII., but is not so in *minuta* VI. Again, the difference of this part of the insect will divide *longicauda* (see IV.) from *lacustris* (see V.).

It appears impossible to decide the species of many ♀ specimens, for instance, the all black abdomen character of *paludosa* is only reliable in the case of ♂s, many of my ♀ *lacustris* lack the yellow bands, and are only placed under the name because they were captured with ♂ of this species.

Figs. I., II. and III. were drawn from the wings of *P. contaminata* L., *P. albimana* F., and *P. lacustris* Mg. respectively, and IV., V., VI., VII. are diagrammatic, and adapted from Tonnoir's illustrations.

STATICE LIMONIUM—ADDENDUM.

J. FRASER ROBINSON.

FROM observations that have been made during the past few years, and especially in 1919-'20 and '21, probably no extension, or very little, of the distribution of *Statice Limonium* is evident, although the number of plant in all the stations has greatly increased. In August, 1919, Mr. G. Cook came upon a clump or two of the *Statice* on the 'outstray' south of the Common, just a few hundred yards east of the Oil Tanks, and the same, or slightly less, distance from the bridge that spans Hedon Haven. The present writer independently found these clumps, with two or three additional ones, on 14th August, 1920. These were all of healthy, large-leaved plants growing among short and fairly well-eaten grass, and flowering well. Further round the bend of the Saltend embankment, on—or rather behind—the west bank of Hedon Haven (? Mr. Petch's station 'A'), on a strip of marshy grass land, intersected by a narrow dike (water) or two, Mr. J. W. Boulton and the writer, on the same date, saw hundreds of plants (60 to 70 clumps of *Statice* were counted), again with large and broad leaves, flowering well amongst the dense grass (? chiefly *Festuca*). Dried specimens in the writer's Herbarium measure 29 cms. from rootstock to tip of flowering panicles, the leaves being 15 cms. to 15.5 cms. in length, and 2.5 to 3 cms. at their broadest part.

No plants of *Statice* were seen on the muddy shores of Hedon Haven, but there was plenty of *Aster Tripolium*, type and variety *discoideus*, that claimed Mr. Petch's special attention some years ago.

The writer has not seen the Sunk Island station of *Statice*, from which, however, he has dried specimens in his Herbarium, being the first recorded by Mr. Petch in 1901. They are fine big plants, but slightly shorter than the Saltend specimens above mentioned, and with narrower leaves (2 cms. to 2.5 cms.).

Station 'E,' Welwick 'Corner,' is now one of the finest bits of saltmarsh or muddy foreshore on the Yorkshire side of the Humber, both as regards its extent—800 yards or more in width from Welwick shore to low water mark of the estuary—and the richness of its flora. Plants of *S. Limonium* from this station were first seen by the writer, in the hands of the late Harvy Sheppard, F.E.I.S., who had just visited the Humber shore from Withernsea, September, 1910. When last visited, on 17th September, 1921, it afforded an interesting study of the maritime (? estuarine, which is slightly different) species of plants. A great growth of Marsh Samphire or Glass Wort

(*Salicornia herbacea*) was observed everywhere; Sea Aster (*Aster Tripolium*) very abundant both in type and var. *discoideus* grew, but always on the more frequently inundated and muddy parts nearer the water; enormous beds of the Shrubby Sea Orache (*Atriplex portulacoides*), with a fairly thick interspersal of *Suaeda maritima*, and, now and again, a few plants of Thrift (*Armeria maritima*) were common, chiefly, however, on the land side of the salt marsh. Then there were *Buda marina*, seedlings of *Cochlearia anglica* (Mr. Stainforth first recorded 1912), *Atriplex lacinata* and very much of the seaside grass—*Glyceria maritima*. Among the above, but to some extent hugging the inland side of the marsh, were observed innumerable patches or beds of *Statice*, which, at the time, owing to the smallness of the leafy rosettes, the shortness and the narrowness of the leaves and large character of individual flowers, we thought might be a species different from *S. Limonium*. In camera, however, the conclusion arrived at was that it was only *S. Limonium*, but *forma* thereof—due probably to the remarkable season that had been experienced prior to and at our visit to Welwick. Another factor had also to be taken into consideration, namely, that our gathering was evidently of flowers of a second flowering period this season.

Besides those stations mentioned in Mr. Petch's article, and in the addendum by the present writer, we have obtained well authenticated evidence of a clump of *Statice Limonium* having been seen in a marshy spot near the South Landing at Flamborough, which makes another station for the East Riding of Yorkshire.

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Hampshire. By **Telford Varley**. Cambridge University Press, 212 pp., 3/6 net. Judging from the length of the row of these 'Cambridge County Geographies' on our shelves, the series must be about complete; certainly the books contain a mine of valuable information relating to the various and numerous subjects which in these days come under the head of 'geography.' The present volume is by the headmaster of Peter Symonds' School, Winchester, who is naturally qualified to prepare a book likely to interest the readers for which it is prepared. The colouring on the geological map at the end is hardly sufficiently pronounced.

Peoples of All Nations, edited by **J. A. Hammerton**, No. 1 (112 pages, 1/3 net. London: Amalgamated Press, Ltd.) If the remainder of this publication, which is to appear in about 48 fortnightly parts, is anything like the specimen before us, it will indeed be a work of permanent value to scientist, artist and antiquary alike. The first section deals with Abyssinia-Algeria, and contains an enormous number of photographs of native 'beauties,' and otherwise, in their natural surroundings. These occur either in the text or on plates, some being gorgeously coloured. The first chapter on 'The Dawn of National Life: An Outline of Racial Origins' is written by Sir Arthur Keith.

HIPPOHAE RHAMNOIDES L. AND ITS NAMES.

ARTHUR BENNETT.

IN *The Naturalist*, 1905, p. 21, at the end of a note on 'Good King Henry,' I asked the question whether any explanation of the name 'Wye-bibbles,' given to the Sea-buckthorn by the natives of Winterton, in Norfolk, could be suggested. So far as I know, no reader has suggested any. The plant grows in its native state abundantly in Kent, on Deal sand-hills; at Thorpe, near Aldborough; in Suffolk; from Caistor to Winterton, in Norfolk; near Skegness, in Lincolnshire; and at Spurn in Yorkshire. South of Skegness, Mr. J. T. Carrington remarks 'the growth is simply magnificent.' I know of no local name in Kent, but in 1714, in J. Sherards and J. Petiver's *Journey into Kent*, they gathered it near Deal, and called it 'Oleaster.' I could hear of no Suffolk local name. In *Nature Notes*, 12 (1899), Mr. H. Mason remarks: 'The poor people and fisher-folk call it Wyrables. I asked what the word meant, and was told, "it means nothing, and is only the name we know for it."' To which there is an editorial note, 'This name appears as winivole, or wyrviolet for Norfolk, in Messrs. Britten and Holland's "Dict. of Eng. Plant Names."' In Dutt's *Book on the Norfolk Broads*, p. 256 (1903), the Rev. G. H. Harris says the natives of Winterton call the edible orange berries by the curious and underivable name of 'Wye-bibbles.'

This remark suggested to Mr. Southwell, of Norwich, writing to the Rev. C. H. Bird, Rector of Brumstead, Norfolk, who replied, 'The Rev. G. H. Harris wrote me in 1897 that he first heard the name at Scratby, Norfolk, and then wrote to Dr. Wright about it, and he replied that it was new to him, but in his *English Dialect Dictionary* will be found:—"Wyebibble" Wyetfl, see Wirwiolet, Wali v. 2 (well selected, choice).

Wirwiolet st. E. Anglian, also in form Whybibbles Norf. The Common Sea-buckthorn, the berry of the plant."

In some way it seems to have descended from the Icelandic (Wale) *velga*; Danish, *valge*; Swedish *valja*; all meaning choice, excellent, and the Scotch 'the best,' 'the pick.' But the present European names give no clue to the name. That of the Dutch islands, 'Dune-thorn,' being equivalent to the Yorkshire (Spurn) name for it.

In *Science Gossip*, p. 278 (1873), it was suggested that the Norfolk name comes from Anglo-Saxon 'wir, a myrtle, and wifel a barb or arrow.' Certainly the spiny branches might suggest this.

I am indebted to the Postmaster at Winterton (Mr. Coffin),

who writes, 'I cannot find the berries are used for any purpose at the present day, but am told at one time the old folks used them for making wine, and also jam.'

Prior, 'Popular Names of British Plants,' p. 273 (1870), gives 'Sallow-thorn,' 'Willow-thorn.'

The prefix occurs in Wiveton or Wiverton, a village in Norfolk, and 'Wive-ton, the settlement of the people of Wiva.' Morley, Eng. Writers, 1, p. 247.

Is there any local name for it in Lincolnshire? Dr. Lees' 'Botany and Outline Flora of Lincolnshire' (1892), and Rev. A. Woodruffe-Peacock, *The Naturalist*, p. 185 (1896), give none. Halliwell, 'Dictionary of Archaic Words,' gives 'Whibibble, a whinn, East.'

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The Proceedings of the University of Durham Philosophical Society, Vol. VI., Pt. 2, contains, among many items, 'Some Aspects of Mining Laws under the Roman Empire,' by H. Louis, and 'The Concept of Behaviour from the Standpoint of Biology,' by F. W. Flattely.

'The Proceedings and Reports of the Belfast Natural History and Philosophical Society for 1920-21 have recently appeared (177 pp.), and include 'The Birds of Hillsborough,' by N. H. Foster, 'Chapters in Modern Botany,' by J. Small, 'Many Inventions: a Study in Natural History,' by J. A. Thomson, and 'The Wonderland of the Wasps,' by J. Ward.

We have received the *Report of the Marlborough College Natural History Society*, No. 70, which contains no fewer than 62 pages, each packed with admirable matter of natural history or archæological interest. We should like to congratulate this Society on its publication, which is much more substantial than that of many of the important natural history societies.

The *Report of the Felsted School Scientific Society*, No. 27 (48 pages), is especially valuable from the carefully prepared Zoological Notes, and an admirably illustrated paper on 'Photographing the Great Crested Grebe' by Mr. J. H. Owen. Reports of other sections of the Society's activities are also given. It is pleasing to find the substantial way in which the study of natural history is dealt with at some of these larger schools.

Mr. Arthur Bennett favours us with a reprint of his notes on '*Fyrola rotundifolia* Linn. in Caithness, with Notes on the Genus,' in which he records a form *chloranthiflora*, and says that the form on the Durham coast, near Hordean Hill, should be looked up again; and *Vaccinium Myrtilus* Linn. var. *pygmaeus* Ostenfeld, f. *microphylla* Lange, in litt. to Beeby, a form from the Isle of Arran (2,345 ft.); reprinted from the *Transactions of the Botanical Society of Edinburgh*.

The recently formed *Isle of Wight Natural History Society* has issued Part I. of its *Proceedings* (48 pp., 2/-). There is a useful summary of the meetings and excursions between December, 1919, and December, 1920. J. F. Rayner gives an account of the Fungi (in two sections); the President, G. W. Colenut, describes The Double Tide of the Solent; Commander G. C. C. Damant gives results of his experiences as a diver with the title 'Submarine Natural History'; and G. E. Gilchrist writes on 'Sandown Meteorology.' There are other meteorological and natural history notes by various members. We congratulate the editor, Mr. F. Morey, on the excellence and local character of his first publication.

YORKSHIRE HOMOPTERA.

W. J. FORDHAM, M.R.C.S., D.P.H., F.E.S.

THE following list of Yorkshire Homoptera is a preliminary enumeration of the species known up to the present to occur in the county. Many of the remarks made at the commencement of the list of Heteroptera recently published in *The Naturalist* apply also to this section of the order, and need not be repeated. The initials after the records are also the same. The only abbreviated references in the following list are (1) Edwards, Jas., 'Hemiptera-Homoptera of the British Isles,' 1896; (2) Buckton, G. B., 'Monograph of the British Cicadæ,' Vol. I., 1890; Vol. II., 1891.

A total of about 380 species in the families comprised in this section has been recorded for the British Isles, and of that number 114 are herein recorded for Yorkshire, leaving a large number of species which are sure to be found in the county to be added to the list.

Family CERCOPIDÆ.

- Triecphora vulnerata* Ill. Edlington Wood and Huddersfield (1), (2); Wadworth Wood, 1902, H. V. C.
- Aphrophora alni* Fall. Bubwith district and Allertorpe Common, W. J. F.; Ecclesall Wood, J. M. B.; Riggmill, near Whitby, W. J. F.; Wheatley Wood, Shirley Pool and Tweenwoods, Wadworth, H. V. C.; Grassington, on willow, R. B.
- Philaenus spumarius* L. Bubwith, Skipwith, Escrick, Allertorpe Common, etc., W. J. F.; Kilnsea (Cordeaux); Doncaster, H. V. C. Ecclesall Wood, Wharnccliffe and Wentworth, J. M. B.; Nunthorpe, W. J. F.; Keighley, R. B.; Ingleborough (J. Dixon); Lofthouse (G. Roberts); Leeds (W. H. Taylor); Pannal and Harrogate (W. D. Roebuck).
- forma *spumarius* Edw. Doncaster district, Brockdale and Tweenwoods, Wadworth, generally common, H. V. C.
- forma *leucophthalmus* L. Brockdale and Tweenwoods, H. V. C.; Keighley, R. B.
- forma *biguttatus* F. Brockdale, Wheatley Wood and Tweenwoods, H. V. C.; Marley, Keighley, R. B.
- forma *gibbus* F. Brockdale and Kilham, H. V. C.
- forma *lateralis* L. Cusworth and Tweenwoods, H. V. C.; Shadwell, Leeds (J. R. Kitchen); Keighley and district, R. B.
- forma *leucocephalus* Germ. Wheatley Wood and Tweenwoods, H. V. C.; Keighley, R. B.
- forma *præustus* F. Shirley Pool, Askern, H. V. C.
- forma *marginellus* F. Tweenwoods, Wadworth, H. V. C.; Shadwell (J. R. Kitchen).
- forma *fasciatus* F. Keighley, R. B.
- forma *vittatus* F. Wadworth, H. V. C.
- forma *lineatus* F. Kilham, Tweenwoods and Letwell, H. V. C.; Shadwell (J. R. Kitchen); Keighley and Grassington, R. B.
- forma *populi* F. Tweenwoods, Wadworth, Shirley Pool and Brockdale, H. V. C.
- P. campestris* Fall. Huddersfield, S. L. Mosley (2).
- P. exclamationis* Thunb. Newsholme Dean, Keighley, R. B.; Huddersfield, S. L. M., (2); Austwick, W. J. F.

Philaenus lineatus L. Doncaster district, abundant and generally distributed, H. V. C.; East Ayton, G. B. Walsh; Ecclesall Wood, Wharncliffe and Wentworth, J. M. B.; Huddersfield, S. L. M. (2); Austwick, W. J. F.

Family MEMBRACIDAE.

Centrotus cornutus L. Grassington, not rare, 1920, R. B.; Huddersfield, S. L. M. (2).

Family JASSIDAE.

Ulopa reticulata Fab. Allerthorpe Common, W. J. F.

Megophthalmus scanicus Fall. Middleton in Teesdale, G. B. W.

Tettigonia viridis L. Doncaster district, generally abundant in damp places. Kilham, H. V. C.; Bubwith and Melbourne, W. J. F.; Camblesforth, Selby, H. V. C.; Askham Bog, W. J. F.

var. *arundinis* Germ. Biller Howe Dale, G. B. W.

Euacanthus interruptus R. Bubwith, Escrick and East Cottingwith, W. J. F.; Sandsend, W. J. F.; Tweenwoods, Cusworth and Wheatley Wood, H. V. C.; Wharncliffe, J. M. B.; Blackhills, Wilsden, J. W. C.; Sunnydale, Keighley, R. B.

E. acuminatus F. Ecclesall Wood, J. M. B.

Batracomorphus latio L. Allerthorpe Common, W. J. F.; Wheatley Wood, H. V. C.; Ecclesall Wood, Wentworth and Wharncliffe, J. M. B.; Eldwick, J. W. C.; Eshton, R. B.

Oncopsis alni Schr. Forge Valley, G. B. W.; Ecclesall Wood and Wharncliffe, J. M. B.; Huddersfield, S. L. M. (2).

O. rufusculus Fieb. Allerthorpe Common, East Cottingwith and Skipwith Common, W. J. F.; Wheatley Wood and Rossington Bridge, H. V. C.; Grassington (common), R. B.

O. flavicollis L. Bubwith, Melbourne and Skipwith Common, W. J. F.; Wheatley Wood, H. V. C.; Ecclesall Wood and Wharncliffe, J. M. B.; Huddersfield, S. L. M. (2); Martin Beck, W. J. F.; Shipley Wood (H. H. Wallis); Eshton, R. B.

Macropsis virescens F. Huddersfield, S. L. M. (2).

Idiocerus adustus H. S. Brockodale, H. V. C.

I. lituratus Fall. Shirley Pool, Askern, H. V. C.

I. fulgidus F. Keighley, R. B.

I. populi L. Wheatley Wood, H. V. C.

I. confusus Flor. Rossington Bridge, H. V. C.; Wentworth, J. M. B.; Eshton, R. B.

I. albicans Kbm. Huddersfield, S. L. M. (2).

Agallia puncticeps Germ. Wadworth, H. V. C.; near York (J. Scott, *E.M.M.*, 1874, p. 237).

A. brachyptera Boh. North Cliff, Scarborough, in newly cut grass, end of June, (T. Wilkinson) (1).

Acocephalus nervosus Schr. Pickering, G. B. W.; Sandsend, W. J. F.; Wentworth, J. M. B.; Wadworth, Wheatley Wood, Shirley Pool, Loversal Carr and Mexbro Ings., H. V. C.

A. bifasciatus L. Scalby High Moor, G. B. W.; Keighley, R. B.

A. albifrons L. Wadworth, H. V. C. (See *E.M.M.*, 1920, p. 56.)

A. flavostrigatus Don. Wadworth, H. V. C.

A. trifasciatus Fourc. Harden Moor, heather, R. B.

Eupelax cuspidata F. Filey Brig, W. J. F.

Athysanus brevipennis Kbm. Huddersfield, S. L. M.

A. sordidus Zett. Wheatley Wood and Rossington Bridge, H. V. C.

A. grisescens Zett. Melbourne, W. J. F.; Wakefield (2).

A. lineolatus Brulle. Sprotborough, H. V. C.; Huddersfield, S. M. L. (2).

A. obsoletus Kbm. Wheatley Wood and Rossington Bridge, H. V. C.; Wentworth, J. M. B.

var. *piceus*, Scott, near Scarborough (T. Wilkinson).

- Deltocephalus ocellaris* Fall. Wheatley Wood and Bentley Ings, H. V. C. ; Ecclesall Wood and Wentworth, J. M. B.
- D. distinguendus* Flor. Ringinglowe, Sheffield, W. J. F. ; Sunnydale, Keighley, on rushes, R. B.
- D. paleaceus* J. Sahl. Austwick, W. J. F.
- D. abdominalis* F. Ecclesall Wood and Wentworth, J. M. B. ; News-holme Dean, Keighley, R. B.
- D. pascuellus* Fall. Wheatley Wood, H. V. C.
- D. cephalotes* H. S. Grassington, R. B.
- D. pulicarius* Fall. Wentworth, J. M. B. ; Grassington (common), R. B.
- D. multinotatus* Boh. North-East Yorks. (Butler). See Edwards, *E.M.M.*, 1915, p. 207.
- Allygus mixtus* F. Holme-on-Spalding Moor, W. J. F. ; Wheatley Wood, H. V. C. ; Keighley, R. B. ; Grassington, on oak, R. B. ; Oughtibridge, J. M. B.
- Thamnotettix prasinus* Fall. Wheatley Wood, H. V. C. ; Ecclesall Wood and Wharnccliffe, J. M. B. ; Keighley and Grassington, R. B.
- T. dilutior* Kbm. Wharnccliffe and Wentworth, J. M. B.
- T. subfuscus* Fall. Ecclesall Wood, J. M. B.
- T. striatulus* Fall. Ecclesall Wood, J. M. B.
- T. splendidulus* F. Edlington Wood, H. V. C. ; Sheffield, W. J. F. ; Ecclesall Wood, J. M. B.
- T. croceus* H. S. Wadworth, H. V. C.
- Limotettix intermedia* Boh. Eshton, 3/8/18., R. B., not previously recorded for England.
- L. antennata* Boh. Kilham and Rossington Bridge, H. V. C. ; Wentworth, J. M. B.
- L. 5-notata* Boh. Kilham, Wheatley Wood and Rossington Bridge, H. V. C. ; Keighley, R. B.
- L. 4-notata* F. Edlington Wood, Blaxton, Bentley Ings and Rossington Bridge, H. V. C. ; Wentworth, J. M. B.
- L. aurantipes* Edw. Eshton, R. B.
- L. sulphurella* Zett. Wheatley Wood, H. V. C. ; Ecclesall Wood, Wharnccliffe and Wentworth, J. M. B.
- Cicadula metria* Flor. Eshton, R. B.
- C. variata* Fall. Wharnccliffe, J. M. B.
- C. 7-notata* Fall. Huddersfield, S. L. M. (2).
- C. frontalis* Scott. Described from specimens from a swampy place, Lastingham (T. A. Marshall) (1).
- C. 6-notata* Fall. Edlington Wood, Wadworth and Wheatley Wood, H. V. C. ; Wentworth, J. M. B.
- C. fieberi* Edw. Keighley, R. B.
- Alebra albostrigata* Fall. Bubwith, W. J. F. ; Wheatley Wood, H. V. C. ; Wharnccliffe and Wentworth, J. M. B.
- Dikraneura flavipennis* Zett. Ruswarp, W. J. F. ; Rossington Bridge, H. V. C. ; Ecclesall Wood, J. M. B.
- D. mollicula* Boh. Huddersfield and Wakefield (2).
- D. variata* Hdy. Ecclesall Wood, J. M. B. ; Keighley, R. B.
- Empoasca smaragdula* Fall. Skipwith Common, W. J. F. ; Wharnccliffe and Wentworth, J. M. B. ; Grassington, R. B.
- E. butleri* Edw. Shirley Pool and Blaxton, H. V. C. ; Grassington, R. B.
- Eupteryx urticae* F. Rossington Bridge, H. V. C. ; Wentworth, J. M. B. ; Keighley, R. B.
- E. stachydearum* Hdy. Ecclesall Wood and Wharnccliffe, J. M. B.
- E. auratus* L. Bubwith and Allertorpe Common, W. J. F. ; Cusworth, Wheatley Wood, Loversall Carrs and Bentley Ings, H. V. C. ; Keighley, common, 1918, R. B.
- E. atropunctatus* Goeze. Keighley, R. B.
- E. pulchellus* Fall. Wharnccliffe and Wentworth, J. M. B.
- E. signatipennis* Boh. Keighley, R. B.

- Eupteryx abrotani* Dougl. Described on specimens from Lastingham (T. A. Marshall) (1).
E. concinna Germ. Wheatley Wood, H. V. C. ; Wentworth, J. M. B.
Typhocya ulmi L. Bubwith, W. J. F. ; Wadworth and Edlington Wood, H. V. C. ; Keighley, R. B. ; Ecclesall Wood, Wharncliffe and Wentworth, J. M. B. ; Huddersfield, S. L. M (2).
T. tenerrima H. S. Huddersfield, S. L. M. (2).
T. crataegi Dougl. Wentworth, J. M. B.
T. leth erryi Edw. Huddersfield, S. L. M.
T. quercus F. Huddersfield, S. L. M.
T. geometrica Schr. Huddersfield, S. L. M.
Zygina flammigera Geoff. Ecclesall Wood and Wentworth, J. M. B.
Z. alneti Dahl. Wharncliffe, J. M. B.
Z. tiliae Fall. Bubwith, W. J. F. ; Carter Knowle, Sheffield, J. M. B.
Z. parvula Boh. Bubwith, W. J. F.

Family FULGORIDAE.

- Cixius pilosus* Ol. Melbourne, W. J. F. ; Huddersfield, S. L. M. ; Knaresbrough (Curtis).
C. cunicularius L. Arncliffe, J. W. C. ; Shelley (H. D. Smart).
C. nervosus L. Escrick, W. J. F. ; Wheatley Wood, Wadworth, Edlington Wood and Bentley Ings, H. V. C. ; Shelley (H. D. Smart) ; Ecclesall Wood and Wharncliffe, J. M. B. ; Blackhills, J. W. C. ; Bingley, Keighley, Cowley, Eshton and Grassington, R. B.
C. brachycranus Scott. Wheatley Wood, H. V. C. ; Shelley (H. D. Smart).
C. similis Kbm. Allerthorpe Common, W. J. F.
Megamelus notula Germ. Eshton, R. B.
Kelisia vittipennis J. Sahl. Ramsdale, W. J. F.
K. punctulum Kbm. Rossington Bridge, H. V. C.
Chloriona smaragdula Stol. Eshton, R. B.
Conomelus limbatus Fal. Doncaster district, abundant and generally distributed, H. V. C. ; Sunnydale, Keighley, R. B. ; Austwick, W. J. F.
Delphax discolor Boh. Ecclesall Wood, J. M. B.
D. tripustulata F. Keighley, R. B.
Dicranotropis hamata Boh. Keighley, R. B.
Stiroma pteridis Boh. Bubwith, W. J. F.

Family PSYLLIDAE.

- Livia juncorum* Lat. Skipwith Common, W. J. F. ; Lastingham and Robin Hood's Bay, W. J. F. ; Rossington Bridge, H. V. C.
Livia crefeldensis Mink. Cleveland (J. W. H. Harrison, *Vasculum*, 1918, p. 52).
Aphalara nebulosa Zett. Ryecroft Glen, Sheffield, on *Epilobium*, J. M. B.
A. exilis Web. and Mohr. Scarborough (F. Wilkinson) (1) ; Eston Woods (J. W. H. Harrison).
Psyllopsis fraxinicola Forst. Huddersfield, S. L. M.
Psyllopsis fraxini L. Beauchief, J. M. B. ; Thorp Salvin, W. J. F.
Psylla crataegi Schm. Bubwith, W. J. F.
P. costalis Flor. Ecclesall Wood, J. M. B. ; Woodsome, Huddersfield, S. L. M. ; Ilkley, W. J. F.
P. peregrina Forst. Askern, S. L. M. Wharncliffe, J. M. B.
P. alni L. Melbourne, W. J. F. ; Ecclesall Wood and Wharncliffe, J. M. B. ; Askern, S. L. M. ; Huddersfield, S. L. M. ; Newholme Dean, Keighley, R. B.
P. forsteri For. Huddersfield, S. L. M. ; Keighley, R. B.
P. buxi L. Bubwith, W. J. F.
Arytaena genistae Lat. Huddersfield, S. L. M.

FIELD NOTES.

Grey Wagtail in the Huddersfield District.—In 1844, Thomas Allis wrote of this bird, 'Not very frequent near Huddersfield.' In the higher parts of our district this bird is not now uncommon. I saw many on the 19th November, 1921, near the source of the River Holme, and throughout the whole of the winter months, up to the 21st March, many birds have frequented the River Colne just below its junction with the River Holme.—W. E. L. WATTAM, Newsome.

Early Yorkshire Cuckoo.—Mr. H. Mortimer Batten, F.Z.S., informs me that he saw a Cuckoo on the moors, near Hutton-le-Hole, on March 29th. It rose from the heather within thirty yards of him. The date is phenomenally early, April 4th being the previous record for Yorkshire. The reports of March Cuckoos are, naturally, looked upon with much suspicion, but coming from such a competent observer as Mr. Batten there can be no doubt as to the correctness of the record.—R. FORTUNE.

White Magpie in Lincolnshire.—On March 8th, Mr. E. P. Rawnsley (of Raithsby Hall, Spilsby, Lincs.), wrote to tell me that the previous week he saw, amongst a flock of about twenty Magpies, a pure white one, which gave him a good view of it, perched on a fence and chattering as he rode by. Magpies appear to be scarce in that district, and Mr. Rawnsley suggests that this conspicuous bird must have come from a distance: and it seems unlikely that this bird if bred in this country, would have survived till March. Possibly these Magpies were from overseas, and were gathered together preparatory to the return migration.—W. H. ST. QUINTIN.

Snow Geese in North Yorks.—I have seen no records of Snow Geese this winter, but from what Mr. James Patterson writes, it seems almost certain that a flock of seven Geese, which visited Goathland on the 4th and 5th of February, when we had some very wild weather with snow and high wind, were of this species. On the first day they almost alighted in a field with some white Wyandotte fowls, and passed within fifty yards of a man who was tending them, before they noticed him, and made off. Mr. Patterson showed the illustration of this Goose in Howard Saunders' Manual to his neighbour, who is satisfied that it represents the birds which he saw. I understand that the flock was seen again in the above district the following day.—W. H. ST. QUINTIN.

Waxwings in Yorks., etc.—INGLEBY GREENHOW, GREAT AYTON.—I obtained a Waxwing, which was killed, out of a flock of about a dozen, by a man who threw a stone at them. They were remarkably tame. It seems to be a 'Waxwing year,' as I have heard of several others in the neighbourhood.

I also got a pair of Mealy Redpoles from near Fylingdales, about a fortnight ago.—(Rev.) M. A. HORSFALL, 5-12-21.

LOWTHORPE AND BATTERSBY, MIDDLESBROUGH AND GROS-MONT.—Two Waxwings were seen in our garden at Lowthorpe, Middlesbrough, on Sunday afternoon, December 4th; several have been about the district at this period, probably part of the visitation noted on other parts of the Yorkshire coast. A friend saw eleven near Grosmont on December 2nd. Others were seen at Battersby, Middlesbrough and Guisboro'. They were generally very tame, and some of them unfortunately found their way into the local bird stuffer's, who also had a Rough-legged Buzzard that had been shot in Cleveland recently.—T. ASHTON LOFTHOUSE, Lowthorpe, Middlesbrough.

SCARBOROUGH.—Along with most places on the East Coast, Scarborough has been favoured by the visits of large numbers of Waxwings. Our local Naturalists' Society has received reports of upwards of sixty having been seen at Scarborough, and in the immediate neighbourhood. The largest flock reported contained more than twenty birds.—T. N. ROBERTS, Scarborough, 22-12-21.

YORK.—Two frequented a garden at Huntington, near York, for a week, and were last seen on January 20th, 1922.—S. H. SMITH.

The winter of 1921-22 has been notable for the great influx of Waxwings. They have been recorded in numbers down the East Coast of Scotland and England, and from many places inland. The recorded instances must refer to only a very small portion of the flocks that have landed in these islands. In addition to the above notes, and those which have previously appeared in *The Naturalist*, Mr. F. Boyes' records (*Field*, 10-2-21) that three were shot on the public common at Beverley on November 22nd, and remarks that 'These birds are remarkably tame, and fall easy victims to the gunners who now-a-day seem to be prowling about nearly everywhere.' Mr. T. K. Fowler informs me that a bird frequented a garden at Thurgoland, near Barnsley, and Mr. Chislett writes that one was seen in a Doncaster garden, and at Hathersage, in Derbyshire. A writer in *The Evening Post* (14-12-21) states that two or three were seen in a village near Selby, 'hobnobbing with the finches and sparrows in the hedge.' Numbers were seen at Barton-on-Humber in December, and several were shot and sent to the local taxidermist for preservation. Some were also seen on Lord Grey's estate at Falloden, Northumberland. The remarkable tameness exhibited by these birds has been the cause of a lot of unnecessary slaughter up and down the country.—R. FORTUNE.

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The Nature Lover for April begins as follows:—'It was towards the end of March that the Earth had, so to speak, turned herself broadside on to the Sun, whose vitalizing rays flooded the face of her from Pole to Pole. Everywhere day and night were of equal length, with the former gaining steadily, and now for six months the balance will be in favour of daylight. And to the warm outpourings of the sun the whole world of living things is responding with outpourings of living green, of beauteous bloom, of bird song, and those varied manifestations of the emotions characteristic of that season of the year.' There are notes also on the Wood Anemone; Scent in Nature, I.—In the Plant World; Swallow Birds; and the Moon, all of which are illustrated.

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.

*(Continued from 'The Naturalist' for 1921, p. 316).**Hahnia montana* Bl.

Widely distributed and not uncommon in Gt. Britain; elsewhere known from four localities in Ireland and from Switzerland; amongst fallen leaves, moss and grass. *Adult* June to August. First occurrence—the author, Stubbing Moor, July, 1902.

V.C. 61.—Riccall Common, Y.N.U.; Houghton Woods (Market Weighton), 2 ♀s, T.S.

V.C. 62.—Kildale, G.B.W.; Middlesbrough district, common, Cleveland, widely distributed but rare, J.W.H.; Egton, W.P.W.; Ravenscar, R.A.T.; Scarborough Mere and Raincliff Woods; Hayburn Wyke; Levisham; Boosbeck; Kilton Woods; Rifts-wood (Saltburn); Marske; Lazenby.

V.C. 63.—Hurst Wood (Shipley), W.P.W.; Scout Wood (Merridale), Ainley Place, Barrett Clough, Drop Clough, all near Slaithwaite, but not commonly.

V.C. 64.—Malham Tarn, T.St.; Trow Gill (Ingleborough); Ingleton; Arncliffe; Goredale; Bolton Woods; Washburn Valley; Stubbing Moor; Roundhay Park, Leeds.

H. pusilla C. L. Koch.

A very rare British spider recorded from Delamere Forest (Cheshire), both sexes, 1906; Abergelle, N. Wales, 1 ♀, 1915. First occurrence—the author, Hebden Bridge, June, 1913.

V.C. 63.—At roots of ling by footpath on right side of stream, Shackleton Wood, Hebden Bridge, 1 ♀.

V.C. 64.—Sawley High Moor, 1 ♀, S.M.

Fam. PISAURIDAE, 1-1.

Gen. *Pisaura* Sim., 1-1.*P. mirabilis* Clerck.

Very widely distributed in the British Isles and on the Continent, extending also into parts of Africa and Asia; among grass, heather and other low vegetation, usually common, but apparently very rare in Yorkshire. *Adult*, June and July, ♀s later also. First record—supposed to be this spider in Lister's *De Araneis* p. 82, 1678, and *Appendicis ad historiae Animalium Angliae*, 1685, p. 3, York.

V.C. 61.—Houghton Woods, imm. ♂, T.S.

V.C. 62.—Robin Hood Bay, 1 ♀, T.S.

V.C. 63.—Near Keighley, R.B., 1 ♀, with egg cocoon.

V.C. 64.—Bishop Wood, C. Smethurst, *The Naturalist*, August, 1877, p. 12.

Fam. LYCOSIDAE, 19-39.

Gen. *Pirata* Sund, 3-4.*P. hygrophilus* Thor.

Continental range very extensive, from Scandinavia to South Russia and extending to Turkestan. In Britain somewhat local in its distribution, but common in some parts of the south of England, Dorset, Bucks., Glamorgan, Cheshire, Staffs., Cambridgeshire, Lincolnshire, and five northern counties (Lancashire the exception); has occurred twice in Ireland, Connaught and Munster, and once in Scotland at Rannoch; in wet places. *Adult* May and June, ♀s also later. First occurrence—the author, Adel bog, June, 1906.

V.C. 62.—Goathland, 1 ♀, J.W.H.

V.C. 64.—Valley of Desolation (Bolton Woods), 1 ♀, and Hurst Wood (Shipley), both sexes, W.P.W.; Austwick Moss, 1 ♀, C. Waterfall; Adel Moor amongst sphagnum in a little stream, several ♀s carrying eggsacs.

P. pivaticus Clerck.*

Common and widely distributed in the British Isles, St. Kilda included, and the whole of Europe, extending also into Algeria and Syria, also in U.S.A.; wet places amongst sphagnum, etc. *Adult*, May to September. First occurrence—the author, Standedge, July, 1897.

V.C. 61, 62, 63, 64.—Very widely dispersed in suitable situations and recorded stations very numerous.

V.C. 65.—How Gill, W.P.W.; Y.N.U., Upper Teesdale; near Cotter Force, Hawes.

P. latians Bl.

Recorded from many parts of England, Dalbeattie in Scotland, and one Irish locality, Carlow, fairly common on the Continent. Season and habitat as in the last. First occurrence, W.P. Winter and the author, Skipwith Common, June 3rd, 1911.

V.C. 61.—Skipwith Common, two of each sex, W.P.W., W.F.; Kelleythorpe, 4 ♀s, June 10th, 1911, Brantingham, 1 ♂ 1 ♀, Houghton Woods, 1 ♀, T.S.

Gen. *Trochosa* C. L. Koch, 5-8.

T. terricola Thor.

Common and widely distributed in the British Isles including St. Kilda, and on the Continent, ranging also into North Africa, and West Asia; in various situations on the ground, among grass, herbage, etc., and beneath stones. *Adult*, March to October. First occurrence—the author, Slaithwaite, June, 1897.

V.C. 61, 62, 63, 64.—Very widely diffused and recorded stations very numerous.

V.C. 65.—Upper Teesdale, Y.N.U.; Coverham and Hardraw, W.E.L.W.; Aysgarth.

T. ruficola De Geer.

Usually common and widely distributed in the British Isles and on the Continent, ranging also into Asia; usually in colonies amongst grass and other herbage or under stones. Apart from districts near the coast, apparently scarce in Yorkshire. *Adult*, autumn to spring. First occurrence—T. Stainforth, Sutton Drain, May, 1908.

V.C. 61.—Humber Bank between Hull and Hessle, Snake Hall (North Cave), Brough, Joint Dock and Timber yard, Aire Street (Hull), Sutton Drain, Haltemprice Lane, Saltend, Kelsey Hill, Spurn, Welwick, Bielsbeck, Hornsea Mere, T.S.

V.C. 62.—Grangetown, G.B.W.; Eston and Ayton, common under stones, J.W.H.; Redcar; Coatham Marshes; Tees Mouth.

V.C. 63.—Saltaire, W.P.W.

T. robusta Sim.

A rare British Spider, recorded from Dorset, Cornwall and Durham side of the Tees Estuary, very like the last. Season the same.

V.C. 62.—Eston, J.W.H.

T. cinerea Fabr.

Recorded for Aberdeen, Perthshire, Cumberland, Northumberland, North and South Wales, Wicklow and Kerry; abroad most

* In New Zealand introduced by means of eggsacs amongst imported European hayseeds.—Ann. Soc. Ent. de France, Vol. LXXXVI., année 1917.

European countries and extending to the Canaries, Caucasus, Turkestan, and the United States of America ; amongst the beds of shingle on the banks of rivers.

V.C. 62.—Northallerton, 1 ♀, recorded by the Rev. O. Pickard Cambridge in Proc. Dorset Field Club, Vol. XXXI., 1910, from specimen sent to him by the collector per F. M. Campbell.

Trochosa picta Hahn.

On sandy ground, most frequent near the sea ; local in distribution but usually abundant where found ; widely distributed in the British Isles and abroad ; Europe, extending to the Azores ; Isle of Man, 1908. *Adult* throughout the year. First record—T. Sheppard, Loftus, *The Naturalist*, September, 1905.

V.C. 61.—Common in sandy places. North Ferriby, Snake Hill, Haltemprice Lane, Houghton Woods, Sand-le-Mere, Bielsbeck, Auburn (Bridlington), T.S. ; Bubwith, J.F. ; Spurn, E.A.P., T.S. ; Bridlington, H.C.D., T.S.

V.C. 62.—Y.N.U. Loftus ; North Bay, Scarborough ; Marske, near the Cemetery ; Teesmouth.

V.C. 63.—Bradford, imm. ex. in a garden, J. W. Forrest.

V.C. 64.—Above Knaresborough, in a sandy spot on left bank of Nidd, 1 imm. ♀.

Gen *Tarentula* Clerck, 2-7.

T. pulverulenta Clerck.

Range very extensive, British Isles, Europe, North Africa and Syria. *Adult*, May and June. First occurrence—the author, Slaithwaite, June, 1897.

V.C. 61, 62, 63, 64.—Widely distributed and recorded stations numerous.

V.C. 65.—How Gill, W.P.W. ; Y.N.U., Upper Teesdale.

T. andrenivora Walck.

Frequents heather clad moors in various parts of Great Britain as far north as Moray ; not yet noted for Ireland ; continental distribution wide. *Adult* early summer to autumn. First occurrence—T. Stringer, Shipley Glen, March, 1908.

V.C. 61.—Bridlington, 1 ♂, 2 ♀s, Allerthorpe Common, T.S.

V.C. 62.—Eston, one of each sex, J.W.H., 1 ♀, W.F. ; Easby Moor, J.W.H. ; Bickley, near Scarborough, one of each sex, H.C.D.

V.C. 64.—Meanwood Side, Leeds, F.B. ; Shipley Glen, 1 ♀, T. St. ; Glusburn, J. Ashworth.

V.C. 65.—Y.N.U., Upper Teesdale, ♀, W.P.W.

Gen *Lycosa* Latr., 9-19.

L. amentata Clerck.

Abundant and very widely distributed in the British Isles and on the Continent from Iceland and Lapland to South Italy and South Russia ; in all kinds of situations on the ground in lanes, fields, woods, etc. *Adult*, May to July, ♀s also later. First occurrence—the author, Slaithwaite, July, 1897.

V.C. 61, 62, 63, 64.—Very extremely diffused and recorded stations very numerous.

V.C. 65.—Y.N.U., Upper Teesdale ; Wensleydale, common.

L. agricola Thor.

Common in many places in North Wales, North of England, Scotland and Ireland, but not yet noted for the south. Continental range extensive, entering Turkestan. *Adult*, May to July, ♀s later also. First occurrence—E. A. Parsons, Croft, July, 1898.

V.C. 65.—Croft, 1 ♀, E.A.P. ; Mickleton (Upper Teesdale) both sexes, W.P.W., W.F.

Lycosa nigriceps Thor.

Widely distributed in the British Isles as far north as the Grampians; Isle of Man, 1908; abroad, Norway, Sweden and N.E. France; usually common, especially in heather districts. *Adult* May and June, ♀s later also. First occurrence—the author, Linton Common, June, 1903.

V.C. 61.—Riccall and Skipwith Commons, W.P.W., W.F.; Barmby Common, J.F.; Allerthorpe Common, T.S.

V.C. 62.—Middlesbrough district, common everywhere on heather and elsewhere in Cleveland, J.W.H.; Hayburn Wyke, Beast Undercliff, Staintondale, T.S.; Scarborough; Scalby Mill; Ringingkeld Bog; Cayton Bay.

V.C. 63.—Lidgett Green, T.St.; Harden Moor, W.P.W.

V.C. 64.—Linton Common, both sexes; Newby Cote (Ingleborough).

V.C. 65.—Cautley, W.P.W.; near Middleton in Teesdale, J.W.H.

L. purbeckensis F. O. P. Camb.

New in 1895, now recorded from the coast of many parts of England and a few places in Ireland and the Crinan Canal (Scotland). *Adult*, May and June, ♀s later also.

V.C. 61.—Humber shore both east and west of Hull, and Spurn, common, T.S. These are all the var. *minor*.

L. pullata Clerck.

Distributed throughout the British Isles including St. Kilda, Northern and Central Europe; abundant in woods, lanes and fields, running about or temporarily sheltering beneath stones, as do others of the same genus. *Adult*, May to July, ♀s later also. First occurrence—the author, Slaithwaite, June, 1897.

V.C. 61, 62, 63, 64.—Very widely diffused and recorded stations very numerous.

V.C. 65.—How Gill, W.P.W.; Hardraw, W.E.L.W.; Y.N.U., Upper Teesdale; abundant in Wensleydale.

L. lugubris Walck.

Widely distributed in the British Isles as far north as Moray, and on the Continent from North Norway and Russia to Adriatic; usually common amongst fallen leaves in woods. *Adult*, April and May, ♀s later also. First occurrence—the author, Butternab Wood, June, 1900.

V.C. 61.—South Cave, E.A.P.; Market Weighton and Houghton Woods, T.S.

V.C. 62.—Eston, J.W.H.; Falling Foss, W.P.W.

V.C. 63.—Bradford, G.H.O. (V.C.H.); Wilsden, R.B.; Martin Beck Wood, C.; Calverley, Saltaire, Hurst Wood (Shipley), W.P.W.; Y.N.U., Deffer Wood; Butternab Wood, Helme and Crosland Edge (Huddersfield).

V.C. 64.—Shipley Glen, Trench Wood (Saltaire), Howden Ghyll, W.P.W.; Bishop Wood; Washburn Valley.

L. herbigrada Bl.

Local in distribution but with a wide range in the British Isles as far north as Inverness; abroad, Norway, Russia, Central Europe and Guernsey. *Adult*, May and June, ♀s later also. First occurrence—the author, Crosland Moor, July, 1907.

V.C. 61.—Pulfin Bog (Beverley), 1 adult ♂, E.A.P.

V.C. 62.—Eston, immature, J.W.H.

V.C. 63.—Crosland Moor, Huddersfield, 2 ♀s.

(To be continued.)

—: o :—

No. 2604 of the Smithsonian Publications deals with 'The Necessity of State Action for the Protection of Birds' (reprinted from the Agricultural Magazine for May, 1919), by Dr. W. E. Collinge.

NEWS FROM THE MAGAZINES.

C. E. Salmon records *Juncus compressus* in S. E. Yorkshire [Hornsea Mere] in *The Journal of Botany* for April.

'The Larval Mouth-hooks of Hypoderma,' by G. Phibbs, is the title of a paper in *The Irish Naturalist* for March.

An account of 'The Roman Site in Dexthorpe and Ulceby' appears in *Lincolnshire Notes and Queries*, No. 132.

'The Early Inhabitants of East Yorkshire,' by T. Sheppard, appears in *Ours, the Magazine of Reckitt's*, Hull, for March.

In *Nature* for March 2nd, Mr. F. A. Mason has an illustrated note on Revival of Sporophores of *Schizophyllum commune* Fr.

In *Science Progress* for January is a remarkable paper by J. F. Marshall dealing with 'The Unofficial Mosquito Control in England.'

British Birds for April, among many important notes, contains 'Notes on the Breeding Habits of the Wood-lark in Dorset,' by W. J. Ashford.

Richard South regrets that, acting on advice, he has decided to withdraw from the duties of Editor of *The Entomologist*. His place will be taken by Capt. N. D. Riley.

The Outline of Science, Part 10 (George Newnes, 1s. 2d. net) has an admirably coloured plate illustrating insect life, and a charmingly written series of articles on various remarkable aspects of the insect world.

A portrait of the late Dr. T. A. Chapman, F.R.S., appears in No. 693 of *The Entomologist's Monthly Magazine*. In the same publication is a lengthy and well-written report of the Annual Meeting of the Yorkshire Naturalists' Union (Entomological Section), by Mr. E. G. Bayford.

Volume XXI. of *The Journal of the Northants Natural History, etc., Club*, among a wealth of local information, contains 'The Northampton Sands of Northampton,' by B. Thompson, 'False Brome Grass in Northants,' by A. J. W. Hornby, and 'Northants Characeae,' by H. N. Dixon.

The Spring issue of *The Geographical Teacher* contains a fine series of papers and notes bearing upon all branches of Geography. The wire-stabbing is very inconvenient and undesirable if the publication is to be preserved, though from the way in which the advertisements are interspersed in the text, this is perhaps not the editor's intention.

We must congratulate *The New Phytologist* on its new appearance. Vol. XXI., No. 1, dated 22nd March, is even better than one of its old fashioned 'double numbers,' and its number and date are given in a way quite convenient for quoting, and we now have not the trouble of cutting the pages. Among the contents are: 'Permeability: Osmotic Pressure,' by W. Stiles; 'A Study of some of the Factors Controlling the Periodicity of Freshwater Algae in Nature,' by W. J. Hodgetts; 'Studies in Phaenology,' by F. Darwin; 'Further Observations upon the Mechanism of Root Pressure,' by J. H. Priestley; and 'Records of Autumnal or Second Flowerings of Plants,' by F. Darwin and A. Shrubs.

Part XXI. of *The Bradford Antiquary*, edited by J. H. Rowe and H. J. M. Maltby, contains the Reports of the Bradford Historical and Antiquarian Society for the years 1919-1921, an obituary notice (with portrait) of the late J. L. Gregory, a paper on 'Early Bradford Friendly Societies,' by H. J. M. Maltby, and an elaborate paper on 'The Roman Road North of Low Borrow Bridge, to Brougham Castle, Westmorland, and on the Route of the 10th Iter.' This is reprinted from the Transactions of the Cumberland and Westmorland Society. This is an excellent paper, but in view of the present charges for printing, we should have thought our Bradford friends would have spent their money in publishing new matter. Several pounds might have been saved by striking off the necessary number for Bradford from the Cumberland and Westmorland Society's type.

NORTHERN NEWS.

'Find of a Celt near Halifax,' evidently a rare event, is recorded in *The Yorkshire Archaeological Journal*, Part 103.

Sir Charles John Holmes, Director of the National Gallery, recently gave a lecture to the Geological Society of London, on 'Leonardo da Vinci as a Geologist.'

According to the press, Mr. W. E. L. Wattam is retiring from the post of Clerk to the Marsden District Council, after twenty-four years' service. Various members of the Council spoke in appreciation of Mr. Wattam's valuable services.

We notice in a recent second-hand bookseller's catalogue, a well-known volume is described as 'Forty Years Residence in British and Saxon Burial Grounds of East Yorkshire.' If the title is correct this should be an interesting volume.

We learn from the Sunday press that 'a robin built its nest in a hedgerow near York, in spite of the fact that there are two German guns, three letter boxes and one water pump not more than 300 yards away.' This is on 'good authority'—yet we doubt it.

In a paper recently read to the Cambridge Philosophical Society, Mr. H. H. Thomas describes some new Jurassic Plants from Yorkshire. He states that *Dictyophyllum rugosum* has been known since 1828, and that its sporangia has now been found near Scarborough.

'The Annual Report of the Gresham's School Natural History Society for 1921' contains many interesting local notes, including a list of the flowering plants in the neighbourhood of Holt, a list of the Hemiptera of the country around Holt; details of the bird migrants, etc.

We learn from the Press that Saturday, being April 1st, the Zoological Garden authorities spent *several hours* answering inquiries for Mr. Lyon, Mr. G. Raffe, and Mr. C. Lion, Mrs. Wolf, Mr. Bear and Mrs. Bird. We fancy the note was *written on* April 1st; anyway, it doesn't fool us!

Mr. W. Whitaker, in his eighty-sixth year—and yet the 'youngest' geologist we know—was entertained to dinner on March 25th by the Geologists' Association, the second occasion on which he has been the Society's President. We trust he may long retain his youthful vigour.

The death is announced of Prof. W. B. Bottomley, at Huddersfield, in his fifty-ninth year. He was for twenty-eight years Professor of Botany and Vegetable Biology at King's College, London, and is, perhaps, best known for his researches on the fertilising properties of bacterised peat.

The Geological Society of London proposes to sell a certain number of surplus copies of the Society's Quarterly Journal for years previous to 1912. These will be sold to Fellows at the rate of 1s. per part, 12 parts for 10s., or 25 parts for £1. Only one copy of each part will be supplied to any one Fellow. We should have thought these publications were worth more.

J. Hermann, of the Librairie Scientifique, 6 rue Sorbonne, Paris, has issued a particularly valuable catalogue of books dealing with Geology and Palæontology, in which the volumes are offered at remarkably cheap rates. For instance, a set of the Quarterly Journal of the Geological Society of London, from Vols. 1 to 61, is offered at 900 francs, which at the present rate of exchange, is very cheap. There is also a set of the four volumes of that Society's Proceedings for 100 francs.

Under the heading of 'A Costly Failure,' we learn from the press that 'The search for oil in England has now ended in definite failure. The Government had set aside a sum of one million over the quest, and concluded an arrangement with Pearson and Company to undertake the boring. Three-quarters of a million have been spent, but the work and quantity of oil discovered has been too small to justify its continuation.' This is what we predicted—as would any geologist—when the venture first started. It seems a pity that all this public money has been wasted.

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Printed at **BROWNS' SAVILE PRESS, 40 George Street, Hull,** and published by **A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.**

May 1st, 1922.

505.42

JUNE 1922.

No. 785
No. 559 of current Series

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield.

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.

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BOTANICAL SECTION.

A MEETING of this Section will be held at Jervaulx Abbey, June 17th and 18th, by the kind invitation of Mr. J. Maughan. Arrangements for accommodation have been made with Mr. S. M. Beswick, Proprietor, Commercial Hotel, Middleham, S.O. Yorks. Terms, 12/6 per day for bed, breakfast, sandwiches and dinner; accommodation is limited, and application should be made immediately.

The routes will include (1) Braithwaite Gill, East Witton Fell. Sowden Beck, Deep Gill and Jervaulx; (2) the Coverdale side of Pen Hill.

The Rev. Canon Garrod has expressed his intention of joining the party on Saturday, and has kindly offered to describe the Cistercian ruins.

CHRIS. A. CHEETHAM,
Farnley, Leeds.

THE ENTOMOLOGICAL SECTION, together with the PLANT GALLS COMMITTEE, will hold a Field Meeting at Askham Bog, York, on June 24th.

Members will assemble at the Tramway Waiting Room, opposite the entrance to York Railway Station, at 10 a.m.

The announcement on the Union's membership card of the Galls Committee meeting at Askham Bog on June 4th is hereby cancelled.

All members and associates of the Union are eligible to attend, and a cordial invitation is given to all.

B. MORLEY,
Sectional Secretary.

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Chester Soc. Nat. Science: Ann. Reports, i.-iv.
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Croydon Nat. Soc. 6th Report.
Dudley and Midland Geol. etc., Soc. Vols. II.-IV.
Discovery. (Liverpool, 4to). 1891.

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NOTES AND COMMENTS.

FORAMINIFERA.

The British Museum (Natural History) has published 'British Antarctic ("Terra Nova") Expedition, 1910. Natural History Report. Zoology, Vol. VI., No. 2, pp. 25-268. Protozoa, Part II., Foraminifera, by E. Heron-Allen, and A. Earland.' From the introduction we gather that 'Seven years have passed since we received from the present Director of the Natural History Museum fifty-four tubes and forty-three jars of varying sizes containing material for examination and report. The work has necessarily been retarded by the War, but has resulted in the recording of more than 650 species and varieties of Foraminifera, forty-six of which are new to Science. Before the Expedition started, we were consulted as to the best methods of collecting, and gladly gave the results of many years' experience; but circumstances appear to have rendered impossible any serious attempt at the collection of foraminiferous material. Apart from the tubes containing the "cores" of soundings (which are of little value from a faunistic point of view), and a few sands from the New Zealand coastal area, the material received consisted principally of sandy debris, evidently the residuum from gatherings of assorted Benthos, and usually "preserved" in formalin, than which no more unsatisfactory medium for the "preservation" of Foraminifera can be imagined.' The volume is magnificently illustrated, and is a valuable contribution to this difficult branch of natural history.

PROF. P. F. KENDALL, M.Sc., F.G.S.*

The announcement, at a recent meeting of the Court of the University of Leeds, of the impending retirement of Professor Percy F. Kendall, Professor in Geology, means that the University is shortly to lose one of its oldest† and most honoured members. His connexion with the University has been a long and valued one. When the subject of agriculture was entered upon in what was then the Yorkshire College in 1891, the teaching of geology was revived, and Professor Kendall received a part-time appointment for teaching geology to students of agriculture and coal mining. This developed into a lectureship, and, ultimately, at the foundation of the University of Leeds, in 1904, into a full professorship. His life's work has been his all-absorbing hobby. With him geological work amounts almost to a passion, and his zeal in its pursuit has inspired many other men to follow this fascinating line of study.

* From *The Yorkshire Post*.

† We don't agree. Prof. Kendall is as young as ever he was.

RESEARCH.

As a research worker, Professor Kendall has covered a very wide field, and his reputation is of the very highest. In the field of glacial geology he ranked almost as a founder. He was elected a member of the Geological Society of London in 1889, and in 1895 that body awarded him the Lyell Geological Fund in encouragement of his early work. In 1909 he received from the Society the distinguished award of the Lyell Medal. He played a very important part in the development of the South Yorkshire coalfield, for in 1908 he was invited by the Geological Section of the Royal Commission on Coal Supplies to report upon the concealed coal measures in that part of the country. It may be said to be very largely due to that report that commercial operations, which have since transformed the character of the whole of South Yorkshire, were undertaken.

CHESHIRE PEAT.

At a recent meeting of the Liverpool Geological Society, Mr. W. G. Travis read a valuable paper 'On Peaty Bands in the Wallasey Sandhills.' He pointed out that 'the principal band described is exposed on the seaward face of the dunes which fringe the Wallasey shore, and with the exception of one considerable gap where the dunes are broken down is visible for a distance of 1 mile 700 yards. The thickness on the whole is from 6 to 9 inches. A detailed study of the plant remains of the bands has been made, which has revealed an abundant moss flora, including nine species of *Hypnum*, several of which have never been found in a living state in the Wirral peninsula. From the evidence of these plant remains, and more especially the characteristic assemblage of mosses, in conjunction with the circumstances in which the remains are preserved, it is clear that these bands of peaty sand and silt are deposits which were accumulated in wet dune 'slacks' such as occur in the flats or hollows among the sandhills on the Lancashire coast. They indicate the former existence of physical conditions in the Wirral dunes which do not now obtain.

YORKSHIRE COALFIELDS.

A coloured map of the Yorkshire Coalfields, described as 'the only complete map,' measuring 44 inches by 36 inches, has been issued by the Business Statistics Co., Baltic House, Cardiff. It is on the scale of one inch to the mile, and is coloured to show the Mineral Takings, the Areas, Colliery Companies, Position of Pits and Railways serving the Collieries. It covers the districts of Doncaster, Barnsley, Leeds, Wakefield, Pontefract, Sheffield, etc., and is sold at £3 3s., which seems sufficient.

SWALLOWS.

Our attention is drawn to a paper by H. J. Massingham in No. 47 of *To-day*. The author states 'Naturalists have known for some years that the Swallow is dying out of Western Europe, and that in a decade or so, if the drainage continues and international action does not secure a reprieve, this bird, a gay streamer at the mast-head of the new year coming up over the horizon, will never more fly that glad signal. Swallows travel northward in spring from North, Central and South Africa and Arabia in rushes lasting over several weeks, and the northern shores of the Mediterranean are convenient inns for them, whose innkeepers murder their guests year after year with ever more effective inventions for a wholesale despatch. It is not true that *Hirundo rustica* is slipping its hold on life from natural causes. Extinction is rarely if ever a guillotine motion in nature, and a species, whether through over-specialisation—an incapacity, that is to say, to adapt itself to new conditions—a failure to progress, or other causes, leaves the world, as no doubt the great saurians left it, by imperceptible steps, parting from it like a lover from his own (albeit unconsciously) with reluctant feet, backward glances and stayings. Swallows are on tiptoe with life; there is no trailing down the airless valleys of stagnation and decay with them; and their responses to the stress of climatic conditions in the arrivals and departures of spring and autumn show a plastic enterprise and weather-wisdom supplementary to the original germinal impulse of migration. Swallows are in the full blush and quiver of vitality.' A correspondent assures us that in the south of France three million swallows were killed for millinery and food in one year!

FLASHLIGHT PHOTOGRAPHY AND NATURE.

The Lancashire and Cheshire Entomological Society recently met to hear a lecture by Mr. Oswald J. Wilkinson upon the above subject. Mr. Wilkinson has made a special study of photography at night by means of flashlight, and last year his series of lantern slides of insect life gained the medal of the Royal Photographic Society. In his address, he shewed how the student could obtain good results at night by means of flashlight, and, at the same time, gather records of the nocturnal habits of insects and other creatures. The speed of the exposure—about 1-5000th of a second—makes the operator almost independent of the movements of the subject. The slides showing the change of the caterpillar of the Painted Lady butterfly proved that during the process of getting rid of its old skin, the caterpillar is in a state of rapid oscillation, but the photographs were as definite as if the insect had been at rest; the succession of pictures showed the differ-

ent stages of this metamorphosis from the first spinning up of the larva, to the fully developed chrysalis; about ten days later, the butterfly breaks out of the chrysalis, and one slide shewed it just after emergence.

THE HULL 'ZOO.'

We have received the following letter from Norway, addressed to 'The Zoological Society of Hull':—'By the present I beg to ask if you should want to provide species of the very rare animal the European beaver (*Castor fiber*). As you know, this animal is now quite exhausted, and only in a river here (The Nidelven) are there a few families left. By applying to the Government, I should perhaps be able to get license to catch a pair or two for your famous zoo.' As the Hull Zoo ceased to exist in 1860, it seems to have been more 'famous' than we had thought.

'ANTHROPOID APE' IN NORTH AMERICA.

One must not too readily accept the sensational account in *The Times*, which quoted the report of Messrs. Osborn, Gregory and Matthew of the discovery of the last molar of a 'Primate' from the Pliocene beds of Nebraska. It may well be that this single tooth (rather insufficient evidence) belongs to quite another group of mammals, as pointed out by Dr. Smith Woodward. Anthropoids in North America are highly improbable. Sensational newspaper articles are not science, and often unreliable from the unacquaintance of their writers with all the ramifications of the subject, and do a vast amount of harm among the uninformed and ignorant readers.

THE GRANTHAM MUSEUM.

We learn from the press that the temporary Library and Museum at Grantham was recently officially opened by Sir Charles Welby. The chair was occupied by the Mayor, who was supported by prominent townsmen. It is hoped when the conditions for building improve, a permanent home will be found for the collection of books and specimens. Mr. H. Preston gave a report with regard to the Museum, and stated that the idea of such an institution originated in 1885, when the Grantham Scientific Society was formed. They have all aimed to make the Museum local in character, and to illustrate the geological, archæological and natural history features of the area. Already many valuable specimens had been placed in the collection.

THE GEOLOGICAL SOCIETY OF LONDON.

Despite the protest in our March number, and the apt remarks in the *Geological Magazine* for March, the Geological

Society of London continues its stupid policy of issuing the 'List of Literature' (for 1921), without a subject index. It is little better than waste paper to any geologist worthy of the name. The list of abbreviations printed on pp. i-iii is absolutely inane. Does the council really think the Fellows are so childish as to need telling what 'Geol.', 'glac.', 'Ital.', 'Mag.', 'U.S.', and scores of other simple abbreviations stand for? We offer our sympathies to Professor Seward on his chaotic inheritance, and hope he will be able to repair, while in office, some of the ruin that has been done.

ORCHID MYCORRHIZA.

This wonderful botanical phenomenon is clearly and scientifically explained by Capt. J. Ramsbottom, in a supplement to the Orchid Catalogue of Messrs. Charlesworth and Co. For nearly a century this cohabitation of fungus and flowering plant has been suspected. The lichen is not now regarded as a separate entity, but as a combination of fungal threads and algal cells. *Monotropa Hypopitys** is another well-known example. In this case the rootlets of the plant are enveloped with fungal hyphæ (*mycorrhiza*=fungus roots), which appear to contribute to the benefit of the host, the parasite flourishing on the exudation of the host. This partnership or co-habitation has been termed *symbiosis*=living together.

SYMBIOSIS.

The fungus is able to subsist on the humus or organic material in the soil, whilst the host plant can only extract nourishment from the inorganic materials, gases, water and mineral matter, and it is found that these symbiotic conditions exist chiefly where the soil has a large humus content. Provisionally, these symbiotic Fungi are classified as *endotropic*=entirely within, as in the lichen, and *ectotropic*=entirely without, as in *Hypopitys*. This mode of life is pointed out as occurring in many of the higher plants†. Salicaceæ, Cupuliferæ, Abietinæ, etc., and some of the mosses, ferns and Lycopods. It was observed by Prof. Weiss (1904), in fossil roots from the lower Coal Measurers, and recently the same association has been found in the fossil plants *Hornea* and *Rhynia* of the Devonian series. Special attention has been directed by the author to the action on Orchids. In the past

* In 1880, the present writer, in company with the Rev. W. Fowler, M. Slater and W. West, gathered this plant on the Southport sand dunes; it was then thought to be parasitic on the roots of certain trees, and the party spent some time trying to trace the connexion, but without result.

† See *The Naturalist*, June, 1917, p. 191.

there has been found great difficulty in germinating the seeds of Orchids, and to some extent this has been surmounted by sowing the seeds on soil used by the parent plant ; but now, when the appropriate fungus *Rhizoctonia* is supplied to the soil, the Orchid seeds germinate without difficulty.

MICROSCOPIC MOULDS.

Several species of microscopic moulds are engaged as *Mycorrhiza*, and it is interesting to notice that a non-chlorophyllus Japanese orchid, *Gastrodia elata*, is said to require the assistance of the *rhizomorphs* of our common woodland toadstool, *Armillaria mellea*. Considering the nature and structure of the moulds and other delicate fungi known to take part as *Mycorrhiza*, and the mycelium (*rhizomorphs*) of *Armillaria mellea*, we are inclined to look upon this as a case of Orchid parasitism and not symbiosis. The seeds of orchids are exceedingly minute, and are produced in immense numbers. Scott estimated the total number of seeds from a plant of *Acropera* to be 74,000,000, and Charlesworth estimated 825,000, from a single capsule of *Cymbidium Traceyanum*. The author considers that it is not unlikely that the enormous seed production is in some way related to the fungus question. He points out the various factors to ensure effective dissemination, but unless the necessary fungus be to hand no germination occurs, the seed may develop to a certain extent, but it does not produce roots unless the appropriate fungus enters its cells.

JOSEPH CHARLESWORTH.

The late Joseph Charlesworth, realizing the mystery of orchid seedling growth, undertook, whilst at an advanced age, the microscopic examination of the orchid roots. He purchased microscopes, microtomes, ovens, stains and other apparatus required in microscopic technique, and in which work he became quite proficient. Fifteen photomicrographs of his preparations illustrate the article, and it has been left to Capt. Ramsbottom, with his academic training, to bring Charlesworth's work down to the grip of the man in the street. The numerous quoted references will be helpful to other workers. It is hoped that the author, in a future communication, will give a detailed account of his work, the nutrient media used, a list of the fungi acting in this symbiotic work, and illustrations of *Rhizoctonia* when isolated from its host.—W.N.C.

EXHIBITION.

In connexion with the Conference of Delegates from the Corresponding Societies of the British Association at Hull early in September, a special effort is being made to arrange an exhibition to illustrate the various activities of the sections

and committees of the Yorkshire Naturalists' Union, one of the leading organizations of its kind in the country. A strong committee has been formed, with Professor J. H. Priestley as Chairman, and Mr. W. R. Grist of the University, Leeds, as Secretary, to organise the exhibition, which will illustrate the Geology, Zoology, Botany, and Archæology of the county in its various aspects. The Hull Education Committee has placed its large board room, immediately opposite the Museum, at the disposal of the British Association for the purpose.

LEEDS AND ITS LECTURES.

'Leeds is almost over-lectured,' observed Lieut.-Col. E. Kitson Clark, one of the Hon. Secretaries of the Leeds Philosophical and Literary Society (Limited), at the annual meeting of that Society, during an exchange of views on the lines which the organisation should follow in the immediate future. Professor P. F. Kendall said he did not think Leeds had too many lectures, and there was an amazing demand for courses. Among the suggestions advanced were the revival of the Saturday evening lectures at the Philosophical Hall, the organisation of courses instead of promiscuous lectures, development with regard to the publication of the *Society's Transactions*, and the award of an annual prize for contributions to literary and scientific knowledge. Gratification was expressed at the nature of the annual report presented by Professor W. Garstang. With few exceptions all the former members and subscribers of the Society had transferred their interest to the new Society. The membership now stands at 178, the decrease being accounted for chiefly by loss by deaths, removals, and cancellation of shares not taken up by families of deceased members. Mr. Crowther's usual series of Christmas museum lectures had been attended by 1,182 persons.

LEEDS MUSEUM.

The effect of the transfer of the Society's museum to the Corporation of Leeds was reflected in the accounts presented by Mr. R. A. Wilson, who reported a bank overdraft of £906 at the beginning of the year. At the end of the first six months, when the Corporation had paid off the increased overdraft, there was a small balance in hand for the completion of the work, and at the end of the full financial year, in which the Corporation had paid two quarterly sums of £250, and subscriptions amounting to £63 had been received, there was a balance of £432 in the bank. Mr. Wilson said it was proposed to set aside £500 of the yearly payment of £1,000 by the Corporation as a sinking fund, so that at the end of the twenty-five years for which the payments were to be made the fund would provide them with an income of £500.

USEFUL SOOT.

In view of the valuable collection housed in the Museum, it is of interest to note the investigations that have been made at the British Museum with regard to the destructive agency of light, especially direct sunlight. The question is not a new one, for museum authorities throughout the country are fully cognisant of this danger, and are continually on their guard against it. Of more interest would be research work as to the best means of preserving specimens so as to render them immune to light. In Leeds precautions are taken at the Museum in Park Row, in rooms which are subjected to the direct rays of the sun. Double roofs and the whitewashing of glass in the roofs during the summer are among the means adopted, but the atmospheric conditions in the city are in themselves a natural screen, for the deposit of sooty material on the roof of the Museum is sufficiently heavy to necessitate periodical removal.

THE MUSEUM AT YORK.

The Yorkshire Philosophical Society celebrates its centenary in July next year. To celebrate the hundredth anniversary the Council are hoping to raise £75,000. Mr. W. H. St. Quintin, the President, and the other officers of the Society, in their appeal to 'the active and substantial support of all who have the intellectual and scientific welfare of the county of York at heart,' point out that without generous assistance the Society will not be able to continue the work of the past, nor to meet the new demands made upon it in order to provide a Museum up to the standard of modern requirements. As to the need for additional buildings, the limit of storage room has been reached, while many valuable collections cannot be exhibited. The collections, the library, and the administrative department, have outgrown their present accommodation. An enlargement of the museum is imperative, as also of the library, which at present is scattered and ill-accommodated; preparation and storage rooms are needed, and an administrative department.

PROF. A. GILLIGAN.

At a meeting of the Council of the University of Leeds, Mr. Albert Gilligan, D.Sc., F.G.S., was elected to the Chair of Geology upon the retirement at the end of the present session of Professor P. F. Kendall. We learn from *The Yorkshire Post* that Dr. Gilligan is of Irish descent, was educated at Wolverhampton Grammar School and University College, Cardiff, where he held a Monmouthshire County Council scholarship, heading the list of candidates for his year. At Cardiff he specialised in geology under Professor

W. S. Boulton, the present occupant of the Chair of Geology at the University of Birmingham. He also attended courses in geology under the late Professor J. W. Judd at the Royal College of Science. While at University College, Cardiff, Dr. Gilligan took an active part in the athletic and social life of the College, gaining his colours in cricket, football and tennis, and also acting as President of the Students' Representative Council. After graduating in the University of Wales he was for a short time on the staff of the Glossop Technical School before being appointed as demonstrator and assistant lecturer in the Geological Department of the Leeds University in 1907. Dr. Gilligan's subsequent career is well known to our readers, and we have frequently referred to his work on the Millstone Grit. In congratulating Dr. Gilligan upon his appointment, we sympathise with him in following a man of the type of Prof. Kendall, whose shoes will take a lot of filling!

TRIBUTE TO PROF. KENDALL.

The Council of the University passed the following resolution in appreciation of Professor Kendall's services:—'The Council record their appreciation of the distinguished service which has been rendered to the science of geology, and to the University of Leeds, by Professor Kendall, who now retires from his Chair on reaching the age limit of his academic duties. As a member of the staff of the Yorkshire College and of the University of Leeds for more than thirty years, Professor Kendall has advanced the study of geology in the University by his gifts as a teacher, and by his powers of interpretative research. He has taken an active part in the corporate life of the University, and has placed the resources of the Department of Geology at the service of students of mining, agriculture and geography.'

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The Rev. J. B. McGovern writes on the old theme of 'The Battle of Brunanburgh' in the *Transactions of the Lancashire and Cheshire Antiquarian Society*, Vol. XXXVIII.

The Annual Report of the Spalding Gentlemen's Society for 1921 contains a good list of useful additions to the Society's library and museum. The Society was founded in 1710, and is thus one of the oldest of its kind in the country.

The Proceedings of the Croydon Natural History and Scientific Society (Vol. IX., Part 2) contain an elaborate report of the Meteorological Committee by F. C. Bayard. Other items are 'The Saxon Settlement of North-East Surrey,' by A. F. Major; and 'Circular Churchyards,' by A. H. Allcroft.

No. 309 of *The Quarterly Journal of the Geological Society of London* contains an account of its annual meeting, including R. D. Oldham's Presidential Address on 'The Cause and Character of Earthquakes,' and a paper by G. W. Lamplugh 'On the Junction of Gault and Lower Greensand near Leighton Buzzard.'

THE SPRING USHER MOTH AND ITS HABITS.

B. MORLEY.

AMONG the oaks in Cannon Hall Park, Cawthorne, the Spring Usher Moth, *Hybernia leucophaearia*, is very abundant, much more so than the moths sitting on the tree-trunks in the day-time would suggest. The insects then seen have emerged on that day, and are reposing on the lower parts of the trunks near the places where their wings developed, until evening. The emergence of the males commences on mild days at about two hours before noon. Only comparatively few emerge and develop on the trunks, most go through that process on the grass stems and fallen leaves under the trees. As oak is the food plant of the larva, it is natural that pupation will take place in the ground at the foot of the oaks, and more moths occur on those trees than on any other; but I have found the moths commonly on the trunks of lime, ash, pine, hawthorn, sycamore, beech, and on February 26th last, three individuals were seen at one time on a small willow tree. Last year a fine specimen of var. *merularia* (Weymer) was taken off palings, from which the suggestion that the moths only sit on oaks is not borne out by fact, and it also indicates that they are more concerned about getting through the daylight hours safely than by the particular tree they rest upon. After dark, the females emerge, and their development being complete, they lose no time before running quickly up the trunks on to the boughs and twigs aloft, where also the males assemble. It is no uncommon thing for this species to remain abundant for a month or even six weeks, and if the weather is uncertain, its time of appearance is generally most protracted. It becomes responsive to mild weather by the middle of January, and will become common in a day or two when climatic conditions remain favourable, but as soon as conditions become adverse, emergence ceases, and those already out disappear, and some seasons, when the weather quickly changes from mildness to severity recurrently, there will be three or four distinct emergences of moths. This Cawthorne race of the species is extremely variable in colour, the typical light form being by far the commonest. The var. *merularia* Weymer is black, but of this I have only seen two individuals; var. *marmorinaria esper*, a form with blackish base and outer margins, is not uncommon, and every gradation between the type and these forms occurs.

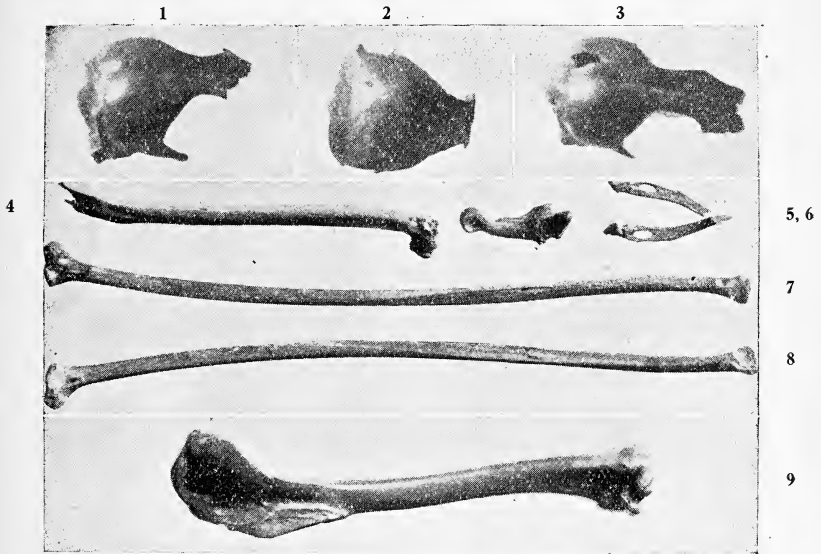
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Natureland for April has notes on Waxwings in Norfolk, What is it? Frog Voices, Southern Pigmy Rattlesnake, Bird Words, Ornithological notes from Cyprus, etc. There are some good plates from photographs.

VERTEBRATE REMAINS FROM THE PEAT OF YORKSHIRE: NEW RECORDS.

T. SHEPPARD, M.SC., F.G.S.

ON account of their friable nature, remains of birds are very rare in the peat deposits of East Yorkshire, and so far the only local record we appear to have is of a skull of a Wild Duck (*Anas boschas* L.), found in the peat at Withernsea; the specimen now being in the Hull Museum. It was recorded in the



Remains of Birds from Yorkshire Peat.

Transactions of the Hull Scientific and Field Naturalists' Club for 1899 (fig. 3).

Many years ago I found the humerus of a bird, which I thought was also duck, in the peat exposed at low tide near the site of the pier at Withernsea, and placed it in the Museum. In view of recent interest being taken in remains from the peat, I submitted it to Mr. E. T. Newton, F.R.S., to whom we have been frequently indebted for help in this way. He states that the bone is the humerus of a Kite (fig. 9), and adds that he is not aware that the species has ever been recognized as a British fossil previously, though the bird was, until recent years, very common in this country.

Through the kindness of Mr. Cecil W. Mason, I have had an opportunity of seeing some bones from the peat at Hornsea and Skipsea, one of which appears to be the skull of a duck,

but the others were not so easy to define. These I also sent to Mr. Newton, who reports as follows:—

WHITE-TAILED EAGLE (*Haliaëtus albicilla* L.). Two radii and two phalanges of digit 2 (figs. 5, 7, 8).

CORMORANT (*Phalacrocorax carbo* L.). Humerus (fig. 4).

JAY (*Garrulus glandarius* L.). Skull and lower jaw ramus (figs. 2, 6).

GOLDEN-EYE DUCK (*Clangula glaucion* L.). Skull (fig. 1).

SMALL SHEEP. Humerus and hyoid bone.

BEAVER (*Castor* sp.). Portions of young skull and vertebræ.

PIKE (*Esox lucius* L.). Clavicle.

SWAN (*Cygnus* sp.). Numerous fragments of egg-shell.

With regard to the latter specimens, I submitted them to Mr. P. R. Lowe, of the British Museum (Natural History), who, after very careful examination, comes to the conclusion that the swan is the species represented.

We have thus been able considerably to extend the record of bird remains in the peat, viz., from one species to seven. It seems rather remarkable that among the few bird bones recorded there should be such a great variety, and that these should include such unexpected species as the Kite, White-tailed Eagle, Cormorant, and Jay; the Swan, Wild Duck and the Golden-eye, in view of their nesting habits, might almost be expected in a peat deposit.

With regard to the mammals; the beaver has previously been recorded for peat of this district, viz., at Wawne, Withernsea and Ulrome (see 'Beavers in East Yorkshire,' by T. Sheppard, *Naturalist*, July, 1903, p. 109). The sheep seems new. The Pike has been recorded on two or three previous occasions.

Since the above lines were written, Mr. J. W. Stather has submitted to me a horn-core from the peat at Barmston which Mr. E. T. Newton states is probably *Bos longifrons*, the short-horned ox. This species has previously been recorded from the peat at Ulrome and Withernsea.

I am indebted to Mr. Mason for the accompanying photograph of his more important specimens, in which is included the Wild Duck skull and bone of Kite, now in the Museum.

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The Spring Number of *Bird Notes and News* contains some caustic comments on 'The B.O.U. and the Egg-Collector.'

Messrs. H. F. and G. Witherby have published an *Index to Vols. 1-12 of British Birds*, and in this way have put workers under a deep debt of gratitude, as the contents of the twelve years' volumes of that useful magazine can now readily be examined, and any particular species or author easily referred to. The Index forms a substantial volume of over 100 pages, is well printed, bound in cloth to match the volumes of the *British Birds*, and sold at 15/-.

THE FOTHERGILL FAMILY AS ORNITHOLOGISTS.

HUGH S. GLADSTONE.

(Continued from page 152).

'The second will comprehend a general view of the *Northern Isles of Britain*, both as to their natural advantages and political consequence. And the third will contain *Collections made towards the Natural and Civil History of Yorkshire*.'*

The titles of these 'undertakings' are sufficiently grandiose to whet one's curiosity as to what was their ultimate fate: I have, however, not been able to discover anything about them. Charles Fothergill (H) is said† to have been the Author of *The Wanderer*, 1803, and *Canada the last hope of England*, published in Canada in 1839 or 1840, but I have never seen copies of these books, which are not in the British Museum Library. He also assisted his uncle, James Forbes, in the publication of his *Oriental Memoirs*, 4 vols., 4to, 1813.‡

Charles Fothergill (H) is known to have carried on a correspondence with William Fothergill (G), his uncle, from 1799 to 1813, extracts from which were sent by 'John Fothergill (I), Esq., of Darlington,' to the editor of *The Naturalist*, and duly published.§ These letters are not of much interest, except, perhaps, one from Charles dated 16th August, 1799, referring to the Willow Wrens, of which he had procured all three, 'the large, middle and small Willow Wrens' of Gilbert White [viz., Wood-Wren, Willow-Wren and Chiffchaff], in Askham Bogs, near York. Both Charles and his uncle seem to have been disciples of Gilbert White and Pennant to judge by their correspondence, and I therefore quote the

* *Op. cit.* pp. xvi., xvii.

† Mr. Watson Fothergill: *in litt.* 4th and 30th May, 1921.

‡ It is a curious coincidence that in 1820 there should have been published—by Charles Fothergill, of Salisbury, who has made the management of birds his favourite study upwards of twenty years—a little duodecimo volume of forty-eight pages, with four plates each comprising nine figures, with title beginning *The British Bird Fancier: or, Bird Fancier's Delight*. Messrs. Mullens and Kirke Swann (in their *Bibliography* already mentioned) presume that this book was written by some bird dealer 'having no connection with Charles Fothergill of York,' and, from investigations I have made, their presumption would appear to be correct. I have not been able to trace Charles Fothergill of Salisbury, but it is possible that local parish registers, or rate books, of the period, might furnish some clue to his identity which is not forthcoming from his *British Bird Fancier*. It is certainly remarkable that in this work the Author should refer (pp. 19, 21) to Wallis's *History of Northumberland*, and that (p. 47) he should give an account of Rooks nesting on the spire of the Exchange, Newcastle-upon-Tyne from 1783 to 1793: these references to the north of England are, to say the least of it, unexpected in a book of the kind written by an inhabitant 'of Salisbury.'

§ *The Naturalist* 1854, Vol. IV., pp. 143-6 and 167-8.

biography of William Fothergill (G) as given by Mr. Bernard Thistlethwaite :—

'William Fothergill was born on 24th October, 1748, at Carr End, Wensleydale, Yorkshire. William Fothergill, yeoman, of Carr End, was married 14th August, 1782, at Counterside Meeting House, to Hannah Robinson, daughter of Amos and Jane Robinson, of Semerdale, the small valley in which Counterside and Carr End lie. William Fothergill, although the second surviving son, succeeded, at the death of his father, Alexander Fothergill, on 21st January, 1788, to the family farm and house at Carr End, where he died in February, 1837, aged eighty-eight years. His wife, Hannah Fothergill, died at Carr End, 22nd June, 1836, and was buried at Bainbridge. By her he had a family of three sons and two daughters,* the eldest of whom was John, and whose biography will be given later.'

William Fothergill (G) was, if nothing more, an observer of nature, and the records of the occurrence of the Little Crake† in 1807, and the Swallow-tailed Kite in 1805, in Wensleydale,‡ are due to him.§ Both these records were subsequently quoted by Yarrell in the three editions of his *History of British Birds*, and when the fourth edition of this work (Vols. I. and II. edited by Alfred Newton, and Vols. III. and IV. by Howard Saunders) was in progress, Newton was at some pains to verify the story of the Swallow-tailed Kite.|| Having recently (28th April, 1921) interviewed Mr. W. S. Fothergill, I am in a position to state that the 'original note' supplied to Newton by 'Mr. William Fothergill of Darlington' (Mr. W. S. Fothergill's father) was in the handwriting of Mr. William Fothergill's grandfather, *not* 'father' as stated by Newton, who is a generation short. This error in genealogy has been copied by Mr. T. H. Nelson in his *Birds of Yorkshire*.¶ As has already been stated, he carried on an ornithological correspondence with his nephew, Charles Fothergill (H), and from what I have been told by his descendants, I can well believe that William Fothergill (G) was the moving spirit, not only of his nephew but also of his son John Fothergill (I), as regards the study of nature.

* *The Thistlethwaite Family: A Study in Genealogy* (1910), p. 161.

† W. Eagle Clarke, in *Handbook of the Vertebrate Fauna of Yorkshire* (1881) suggests (p. 64) that this may have been a Baillon's Crake, but T. H. Nelson, in *The Birds of Yorkshire* (1907) retains it (Vol. II., p. 538) as a Little Crake.

‡ *Trans. of the Linnaean Society*: Vol. XIV. (1825), pp. 583-584.

§ See also *op. cit.* Vol. XIII. (1822), 'Some Observations on the Economy of the Toad,' by William Fothergill, pp. 618-620.

|| *A History of British Birds*, by William Yarrell (4th ed.), Vol. I., 1871-4, ed. by Alfred Newton, pp. 104-5 and 107-8.

¶ T. H. Nelson: *The Birds of Yorkshire* (1907), Vol. I., p. 348.

All the above may, at first glance, seem a long preamble to the object of this article, but I feel that this genealogical sketch has been necessary to substantiate my contention that John Fothergill (I) was the 'ingenious surgeon at Askrig.'

John Fothergill was born on 13th May, 1785, at Carr End, Wensleydale, Yorkshire. He was a Member of the Royal College of Surgeons, London, and practised medicine in Askrigg, County York, and in Darlington, County Durham. He was married 25th May, 1815, to Ann Rimington, daughter of Edward Rimington, cabinet-maker, of Liverpool, by whom he had a family of five sons and two daughters. His three eldest children were born at Askrigg on 29th February, 1816, 23rd August, 1817, and 13th July, 1819, but his fourth child was born on 10th January, 1821, at Darlington, where his remaining two children were born.* John Fothergill died on 20th January, 1858, and was buried in the Friends' burial ground behind the Meeting-house at Darlington. He was well known as a strong advocate of total abstinence from intoxicants, and was, in his day, one of the original half dozen doctors who asserted that Man can live without alcohol. A drinking fountain was erected, in 1862, to his memory in Bondgate, Darlington, but was subsequently removed to its present position in the public park.†

Several of John Fothergill's descendants are still alive, and I have already said that two of his grandsons have given me material assistance. The class tickets, showing that John Fothergill (I) studied at Guy's and St. Thomas's Hospitals in 1813 and 1814 are still treasured, as is also a daguerreotype photograph of him and several of his sketches of birds. Some of these latter I have seen, notably those of a Smew dated 1806, a Magpie dated 1807 and a Swallow-tailed Kite dated 1854, and of the last mentioned I believe that there is more than one copy extant. These sketches clearly show that John Fothergill (I) was a careful ornithological artist. He appears to have been an affectionate and prudent father, and as regards his medical practice he was one of the old-fashioned ultra-professional doctors who did not send out bills. His wealthier patients used to send him payments from time to time, but the poorer ones paid nothing: needless to say he did not leave a fortune. It may perhaps be worth adding that his son, Dr. John Rimington Fothergill (b. 25th March, 1825) joined his father in practice at Darlington in 1848, and that he only died so recently as 13th December, 1915.

* Bernard Thistlethwaite, *tom. cit.* pp. 161-2.

† The inscription on the fountain states that John Fothergill was 'President of the Darlington Total Abstinence Society from its formation until his death,' that he was 'Highly respected for his professional skill and practical Philanthropy,' and that the fountain was 'erected by the voluntary subscriptions of his fellow townsmen.'

Besides the published pedigrees which I have quoted, I have seen documentary evidence which establishes the fact that John Fothergill (I) was the son of William Fothergill (G), and therefore first cousin of Charles Fothergill (H). That John Fothergill (I) was the 'ingenious surgeon at Askrig' to whom the author of the *History of Richmondshire* in 1823 'acknowledges his obligations' for a list of local birds, I think there can be no doubt. We have seen that he was a Member of the Royal College of Surgeons, London (which degree neither his father nor first cousin attained) and also that he was in practice at Askrigg in July, 1819, and perhaps later, though it has been shown that he had removed to Darlington in 1821.

As regards the actual list of Birds, this, as has already been stated, is published in Whitaker's *History of Richmondshire* (1823).^{*} It comprises seventy-one names of birds, and the list is of no little importance, since it gives 'the first Yorkshire mention'—according to Mr. T. H. Nelson, Author of the *Birds of Yorkshire*—of the Shoveler, Tufted Duck, Green Sandpiper, Red-necked Grebe, and Slavonian Grebe under the name of 'Dusky Grebe.' I find that Mr. Nelson refers to the list no fewer than fourteen times,[†] but he attributes it to Charles Fothergill (H).[‡] This list of John Fothergill's (I) also includes (as might be expected since his father William Fothergill (G) was the first to chronicle them: *vide antea*) the Swallow-tailed Kite and the Little Crake: there are, moreover, several curious names for birds which are no longer recognised, such as Weasel Coot (*Mergus minutus*) for the Smew; Red Sandpiper (*Tringa islandica*) for the Knot, and Great Coot (*Fulica aterrima*) for the Coot. It must not be thought that this list of Wensleydale birds has hitherto been forgotten: it is duly recorded in the *Geographical Bibliography of British Ornithology* § as by 'Fothergill,' but without any distinguishing Christian name, and, as we have seen, it has been freely quoted in the *Birds of Yorkshire*, but is there wrongly attributed to Charles Fothergill (H).

Instead of taking 'The Fothergill Family as Ornithologists' as the title for this paper, I might perhaps have headed it 'Honour to whom honour is due,' for this text has been my incentive in compiling these notes on the 'ingenious surgeon at Askrig' who, I think it is now clear, was John Fothergill (I).

^{*} Thomas Dunham Whitaker: *An History of Richmondshire, in the North Riding of the County of York*, Vol. I. (1823), pp. 415-416.

[†] T. H. Nelson: *The Birds of Yorkshire* (1907), Vol. II., pp. 378, 381, 425, 426, 451, 464, 466, 481, 631, 638, 641, 740, 742, 743.

[‡] *Tom. cit.* p. 820.

§ W. H. Mullens, H. Kirke Swann, and Rev. F. C. R. Jourdain: *A Geographical Bibliography of British Ornithology*, 1920, p. 337.

PLANT GALLS OBSERVED NEAR SCARBOROUGH, 1921.

HAROLD J. BURKILL, M.A., F.R.G.S.

LAST year I spent some days at Scarborough, and then moved north to Ravenscar. I was able to keep notes of the various species of Plant Galls that I came across, and the following list has been compiled from those notes. Some of the items may be of interest to other workers of the subject in Yorkshire. The host plants are given in order of 'The London Catalogue,' and I think all the localities can be found on the Ordnance Survey Maps of the district.

Many species were no doubt overlooked, and I know that I failed to find several that I had seen in other years, but it was impossible to visit all the old spots in the course of a month's holiday. My notes of those earlier years have never been worked out into any order, and as I see just now no prospect of getting the necessary time to compile a full list, the present contribution is offered as an addition to those lists that have recently appeared in *The Naturalist*, in the hope that it may help to fill in some blanks in the County record.

In addition to those in the main list, the following usually occurred wherever the host plants were found :—

Aphis spec. (*Prunus spinosa*); *Perrisia ulmariae* Bremi (*Spiraea ulmaria*); *Rhodites rosae* Linn., *R. eglanteriae* Hartig, and *P. rosarum* Hardy (mainly on *Rosa canina*); *P. crataegi* Winn., and *Eriophyes goniothorax* Nal. (*Crataegus monogyna*); *P. fraxini* Kieff., and *Psyllopsis fraxini* Linn. (*Fraxinus excelsior*); *Perrisia veronicae* Vallot (*Veronica chamaedrys*); *Neuroterus baccarum* Linn., and *N. lenticularis* Oliv. (mainly on *Quercus pedunculata*); *Pontania proxima* Lieb. (*Salix* 5 spp.); *Oligotrophus capreae* Winn. (*S. caprea*, *aurita*, *cinerea*; its var. *major* Kieff. on the last two); *Rhabdophaga rosaria* H. Löw on the same three species.

LIST.

- Capsella Bursa-pastoris* Medic., galled by fungus *Cystopus candidus* Lév., near Cayton.
- Stellaria holostea* Linn. :—*Brachycolus stellariae* Hardy. Three places near Ravenscar, and also Beast Cliff.
- S. graminea* Linn. :—*Eriophyes atrichus* Nal. Staintondale Moor.
- Hypericum humifusum* Linn. :—*Perrisia serotina* Winn. Near Falcon Inn.
- Rhamnus catharticus* Linn. :—*Trichopsylla walkeri* Förster. Scalla Moor, Pickering.
- Acer Pseudo-platanus* Linn. :—(i) *Eriophyes macrorrhynchus* Nal., Ellerburn. (ii) *Eriophyide*, apparently Houard No. 3976 or 3977, Hayburn Wyke.
- A. campestre* Linn. :—(i) *Diploside* (Houard 4027), Scalla Moor, Pickering. (ii) *Perrisia acercrispans* Kieff., near Stoupe Beck, Robin Hood's Bay. (iii) *Eriophyes macrorrhynchus* Nal., Pickering. (iv) *E. macrochelus* Nal., near Fyling Hall Station.
- Cytisus scoparius* Link. :—(i) *Asphondylia mayeri* Liebel, Hardhurst Moor. (ii) *Perrisia tubicola* Kieff., Hardhurst Moor.

- Lotus corniculatus* Linn. :—(i) *Contarinia loti* De Geer, Cornelian Bay, (i) *Perrisia loticola* Rüb., seven places near Ravenscar and Robin Hood's Bay; Falcon Inn and Beast Cliff. Also on *L. uliginosus* Schk., Ravenscar. (iii) *Eriophyes euaspis* Nal., Robin Hood's Bay.
- Vicia cracca* Linn. :—*Perrisia viciae* Kieff., Scalla Moor, Cornelian Bay, and seven places from Robin Hood's Bay to Cloughton.
- V. sylvatica* Linn. :—*Cecidomyide* (Houard 3730). Hayburn Wyke.
- Lathyrus pratensis* Linn. :—*Perrisia lathyri* Kieff. Pickering and three places near Ravenscar.
- L. montanus* Bernh. :—(i) *Perrisia* sp., probably *P. schlechtendali* Kieff., (Houard 3781), Oliver's Mount, Scarborough, Beast Cliff and Ravenscar. (ii) *Perrisia* sp., probably Houard 3775), Beast Cliff.
- Prunus spinosa* Linn. :—*Eriophyes similis* Nal. Langdale End and various other places near the coast.
- P. padus* Linn. :—*Aphis padi* Linn. Near Fyling Hall Station.
- Spiraea ulmaria* Linn. :—*Perrisia pustulans* Rüb. Along the coast from Cornelian Bay to Robin Hood's Bay.
- S. filipendula* Linn. :—*Perrisia ulmariae* Bremi. Cliffs above White Nab.
- Rubus plicatus* Weike. and Nees :—(i) *Perrisia plicatrix* H. Löw, Beast Cliff. (ii) *Eriophyes gibbosus* Nal., Beast Cliff. (iii) *Coniothyrium Fuchelii* Saccardo, Beast Cliff.
- Potentilla erecta* Hampe :—*Xestophanes brevitarsis* Thoms. Apparently generally distributed on the moors between John Cross, Brompton Moor, Robin Hood's Bay and Staintondale.
- P. reptans* Linn. :—*X. potentillae* Ratz. Oliver's Mount, Scarborough.
- Pyrus Aucuparia* Ehrh. :—*Eriophyes pyri* Pagnst. Hayburn Wyke, Black Beck, Langdale and Bloody Beck.
- P. malus* Linn. :—*Aphis* sp. Oliver's Mount, Scarborough.
- Epilobium angustifolium* Linn. :—*Perrisia kiefferiana* Rüb. Near Seamer Carr House, and near Evan Howe.
- Heracleum sphondylium* Linn. :—*Macrolabis corrugans* F. Löw, Near Cayton.
- Galium verum* Linn. :—*Perrisia galiicola* F. Löw. Givendale Head, Troutdale, Cornelian Bay and Ravenscar.
- G. palustre* Linn. :—*Perrisia hygrophila* Mik. Jugger Howe Dale above Wragby Wood.
- G. Aparine* Linn. :—*Eriophyes galii* Karp. Scalla Moor, Ravenscar and Beast Cliff.
- Solidago virgaurea* Linn. :—(i) Three withering heads found with the stems swollen and curved. No causer discovered. Undercliff, Ravenscar. (ii.) Buds swollen and coloured red. Interior occupied by a white larva—apparently Dipteron, Cliffs at Ravenscar and Beast Cliff. (iii.) Bud swollen and aborted, occupied by a Lepidoptera larva. Undercliff, Ravenscar.
- Achillea millefolium* Linn. :—*Tylenchus millefolii* F. Löw. Deepdale, Oliver's Mount, Scarborough.
- Centaurea nigra* Linn. :—(i) *Urophora solstitialis* Linn., frequent along the coast from Cornelian Bay to Robin Hood's Bay. (ii) Flower heads containing a different species of larva, near Fyling Hall Station.
- Hieracium umbellatum* Linn. :—(i) *Aulacidea hieracii* Bouché, near Ravenscar, and near Evan Howe. (ii) *Carphotricha pupillata* Fallen, cliffs, Ravenscar and Beast Cliff. (iii) *Tylenchus* sp., swellings on midribs and blades of leaves, cliffs, Ravenscar.
- Hypochoeris radicata* Linn. :—*Anguillulide* sp. (Houard 6040). Stoupe Brow Moor.
- Taraxacum erythrospermum* Andez. :—*Tylenchus* sp. Ravenscar.

- Vaccinium vitis-idaea* Linn. :—*Exobasidium vaccinii* Wor. Bloody Beck Moors.
- Erica tetralix* Linn. :—*Perrisia* sp. White cocoons distorting the stem. Frequent on the moors.
- Nepeta hederacea* Trev. :—*Oligotrophus bursarius* Bremi. Oliver's Mount and Ravenscar.
- Plantago lanceolata* Linn. :—Leaves swollen on upper surface with curving lines suggestive of *Eriophyes*, but nothing detected on examination. Beast Cliff.
- Atriplex patula* Linn. :—*Aphis atriplicis* Linn. Seamer Moor.
- Rumex acetosella* Linn. :—*Apion* sp. Deepdale, Oliver's Mount.
- Buxus sempervirens* Linn. :—*Psylla buxi* Linn. Ravenscar.
- Ulmus glabra* Huds. :—*Schizoneura ulmi* Linn. Oliver's Mount and Ravenscar.
- Urtica dioica* Linn. :—*Perrisia urticae* Perris. Pickering, Cloughton, Seamer Carr House and Robin Hood's Bay.
- Betula alba* Linn. :—(i) *Eriophyes rudis* Canest., Hayburn Wyke. (ii) *E. lionotus* Nal., Hayburn Wyke.
- B. tomentosa* Reith and Abel :—*Contarinia betulina* Kieff. Beast Cliff.
- Alnus rotundifolia* Mill. :—(i) *Eriophyes nalepai* Focken., Ellernburn, Cornelian Bay, Langdale, Jugger Howe Dale and Fyling Hall Station. (ii) *E. brevitarsus* Focken. Ellernburn and Jugger Howe Dale.
- Corylus avellana* Linn. :—*Eriophyes avellanae* Nal. Near Fyling Hall Station.
- Quercus pedunculata* Ehrh. :—(i) *Andricus fecundator* Hartig., Hayburn Wyke, Cross Cliff and near Evan Howe. (ii) *Neuroterus albipes* Schenck, near Fyling Hall Station. (iii) *N. laeviusculus* Schenck, Hayburn Wyke, Howe Dale and near Fyling Hall Station. (iv) *N. numismatis* Oliv., Hayburn Wyke, Cross Cliff and near Ravenscar. (v) *Dryophanta divisa* Hartig., Scalla Moor, and near Fyling Hall Station. (vi) *D. longiventris* Hartig., Ellernburn and Hayburn Wyke. (vii) *Andricus ostreus* Giraud, Raincliffe Woods, Ellernburn, and near Fyling Hall Station.
- Q. sessiliflora* Salisb. :—(i) *Neuroterus laeviusculus* Schenck, Howe Dale, Bloody Beck and Harwood Dale. (ii) *N. vesicator* Schl., Harwood Dale. (iii) *Dryophanta agama* Hartig., Harwood Dale. (iv) *D. longiventris* Hartig., Harwood Dale. (v) *D. folii* Linn., Bloody Beck. (vi) *Andricus ostreus* Giraud., Harwood Dale and Bloody Beck. (vii) *Macrodiplosis dryobia* F. Löw, Bloody Beck.
- Fagus sylvatica* Linn. :—*Oligotrophus annulipes* Hartig., Hayburn Wyke.
- Salix pentandra* Linn. :—*Cryptocampus medullarius* Hartig., Raincliffe Woods.
- S. triandra* Linn. :—*Rhabdophaga nervorum* Kieff. Near Cowgate Slack.
- S. fragilis* Linn. :—(i) *P. bridgmani* Cam., Cornelian Bay. (ii) *Cryptocampus testaceipes* Zadd., Cornelian Bay. (iii) *Perrisia terminalis* H. Löw, Cornelian Bay and Tan Beck. (iv) *Eriophyes* sp. (Houard 591), Cornelian Bay.
- S. alba* Linn. :—(i) *Perrisia terminalis* H. Löw, cliffs south of Scarborough and Cornelian Bay. (ii) *Eriophyes* sp. (Houard 628), Cornelian Bay.
- S. purpurea* Linn. :—(i) *Pontania salicis* Christ, Wrench Green and Cornelian Bay. (ii) *P. viminalis* Hartig., Cornelian Bay. (iii) *Rhabdophaga nervorum* Kieff., Cornelian Bay. (iv) *R. salicis* Schrank, Cornelian Bay. (v) *Perrisia terminalis* H. Löw, Cornelian Bay.
- S. viminalis* Linn. :—*Perrisia marginem torquens* Winn. Wrench Green, Oliver's Mount and Cornelian Bay.
- S. caprea* Linn. :—(i) *P. bridgmani* Cam., Ravenscar. (ii) *Cryptocampus ater* Jurine, Harwood Dale Moor, and cliffs, Robin Hood's Bay.

- (iii) *C. venustus* Zadd., Beast Cliff. (iv) *Rhabdophaga nervorum* Kieff., Ravenscar, Robin Hood's Bay and Hardhurst Moor. (v) *R. salicis* Schrank, Ravenscar.
- Salix aurita* Linn. :—(i) *P. pedunculi* Hartig., Beast Cliff. (ii) *Cryptocampus saliceti* Fall., near Flask Inn. (iii) *Rhabdophaga nervorum* Kieff., Beast Cliff. (iv) *R. salicis* Schrank, near Flask Inn and Cowgate Slack.
- S. cinerea* Linn. :—(i) *P. pedunculi* Hartig., Falcon Inn, Ravenscar, Beast Cliff, Jugger Howe Dale, Staintondale Moor, and Hardhurst Moor. (ii) *P. salicis* Christ, Jugger Howe Dale. (iii) *Cryptocampus venustus* Zadd., near Falcon Inn, near Red House, Cross Cliff, Jugger Howe Dale, Stainton Dale Moor, Hardhurst Moor, and Cowgate Slack. (iv) *C. ater* Jurine, Ravenscar. (v) *C. saliceti* Fall., near Falcon Inn, cliffs, Ravenscar and Robin Hood's Bay, Stoupe Brow Moor, Stainton Dale Moor and Cowgate Slack. (vi) *Rhabdophaga salicis* Schrank, near Falcon Inn, Ravenscar, Stoupe Brow Moor, and Jugger Howe Dale. (vii) *R. nervorum* Kieff., frequently noted between Beast Cliff, Jugger Howe Beck and Evan Howe. (viii) *R. heterobia* H. Löw, Jugger Howe Dale. (ix) *Eriophyes tetanothrix* Nal., near Falcon Inn, Beast Cliff, Iburn Dale, Jugger Howe Dale, Stainton Dale Moor and Hardhurst Moor.
- S. repens* Linn. :—(i) *Pontania salicis* Christ., Harwood Dale Moor, near Mitten Hill, Hawsker and Biller Howe Dale. (ii) *Rhabdophaga salicis* Schrank, Harwood Dale and Biller Howe Dale. (iii) *R. rosariella* Kieff., with the last species. (iv) *Eriophyes tetanothrix* Nal., Harwood Dale, and near Mitten Hill.
- Populus nigra* Linn. :—*Taphrina aurea* Fries., Oliver's Mount and Holbeck Gardens, Scarborough.
- Picea excelsa* Link. :—*Chermes abietis* Kalt. Near Soulsgrave Slack.
- Juncus* sp. :—*Livia juncozum* Latr. Five large galls seen, Jugger Howe Beck near Wragby Wood.
- Agropyron repens* Beauv. :—*Isosoma graminicola* Giraud. Along the coast, Cornelian Bay to Robin Hood's Bay.
- Pteris aquilina* Linn. :—(i) *Perrisia filicina* Kieff., Dalby Warren and most areas on the moors or cliffs where the host plant grows. (ii) *Anthomyia signata* Brischke, Hayburn Wyke, Beast Cliff and Iburn Dale. (iii) *Eriophyes pteridis* Moll., Beast Cliff, Iburn Dale and Jugger Howe Beck near Wragby Wood.

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Bulletin No. 5 of the *Bureau of Bio-Technology* contains some well-illustrated notes, including 'A Rapid Method for the Estimation of Acetaldehyde,' by N. K. Smitt; 'A Book of Yeasts,' by F. A. Mason; 'The Isolation of Bacteria from Beer Deposits,' by P. Hampshire; '*Trogloderma khapra*'; 'A Note on Soil Sterilisation for Tomatoes,' by T. Parker, A. W. Long and J. S. Mitchell; 'Red Spider: a Note on its Control,' by Theodore Parker, as well as interesting Notes and Comments.

The Annual Meeting of the Darlington and Teesdale Naturalists' Field Club was held recently. The Hon. Treasurer (R. H. Sargent) presented the balance-sheet, showing a balance in hand of £16 18s. 3d. The Hon. Secretary (J. E. Nowers), in his annual report, showed that the club had had the most successful season for some years. The eight Saturday excursions were all successfully carried out, with an average attendance of 22. A considerable amount of botanical and geological work was done. Many interesting and instructive papers were read and discussed. Numbers of specimens have been added to the club's collections. The total membership is now 118. The retiring President, Mr. C. P. Nicholson, proposed Mr. Walter Hodgson as President for the ensuing year, and the latter took the chair.

STATICE AND ATRIPLEX IN LINCOLNSHIRE.

ARTHUR BENNETT.

IN *The Naturalist* for April, Mr. T. Petch, on p. 124, remarks on the above species: 'Does not (if my information is correct) pass over into Lincolnshire.' The history of this species in Lincolnshire, is as follows:—

In *The Botanist's Guide*, p. 388 (1805), Sir Joseph Banks gives its habitat as 'on the salt marshes near Frieston, Leverton, etc.; and also near Fosdyke: it grows in the level grassy land, where the sheep bite close.' There are specimens thence in Banks' Herbarium at the Natural History Museum at South Kensington! In the year 1826, Dr. Howitt* sought it without success. In *The Naturalist* (1895), p. 101, the late Rev. A. Woodruffe-Peacock remarks, 'Native, but extinct, I believe.' I know of no specimens other than the Banksian Herbarium.

A similar case in point is *Atriplex pedunculata* L. In the Guide before quoted, Sir J. Banks remarks on this, 'Near Skirbeck Church Yard, half a mile from Boston, on the roadside between Fosdyke and Cross-key Washes, in some years vastly abundant, in others very difficult to find.' In the Banksian Herbarium there is a sheet of twelve specimens from 'Skirbeck, near Boston,' Lightfoot! In *The Naturalist* (1896), p. 184, Rev. A. Woodruffe-Peacock notes, 'Native, Buddle and Banks Herbs. Brit. Mus. Burgess' Paintings.' The latter I do not know the date of. Looking through the Rev. Woodruffe-Peacock's Papers in *The Naturalist* from March 1894 to March 1900, I cannot find he mentions any date; nor can I find it mentioned in his Papers in *The Trans. of the Lincoln. Nat. Union*.

This last species is very peculiar in its appearances; in some years in Kent I have seen it by hundreds (up to eight ins. high); two years after one or two specimens about two inches high may be found.

I do not know whether the Rev. Woodruffe-Peacock suggests any reason for the disappearance of these two species, in his MS. Flora, the latter portions of which are all I have seen.

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Among the contents of *The Journal of the Ministry of Agriculture* for May, we notice: 'Germination of Indigenous Grass and Clover Seeds,' by Prof. R. G. Stapledon; 'Depth of Sowing Grass and Clover Seeds,' by R. D. Williams; 'The Liver Rot Epidemic in North Wales,' 1920-21, by C. L. Walton; and 'Chocolate Spot Disease or Streak Disease of Broad Beans,' by S. G. Paine and Margaret S. Lacey.

* *New Bot. Guide Supp.*, 651 (1837).

FIELD NOTES.

BIRDS.

Grey Hen in the Wilsden District.—The other day Mr. Leach, late head woodman to Mr. Ferrand, St. Ives, Bingley, informed me that a few years ago, he thinks in 1917, he saw a Grey Hen several times on Blackhills, near Wilsden, but never saw a male. A few years prior to this another Grey Hen was seen, and a nest was found with eggs, but the bird was unfortunately shot.—E. P. BUTTERFIELD.

Turtle Dove in Yorkshire.—With reference to *The Naturalist*, pp. 125-127, I was living at Skipwith from 1893 to 1906, and I cannot remember a season in which there was none of these birds about, and every spring one or two pairs were nesting on the Common, particularly in some of the larger clumps of birches. Since coming to Saxton, in 1906, I have generally noted Turtle Doves close to my house, and on two occasions a pair has nested in the small belt of plantation surrounding the grounds.—C. ASH, Saxton Vicarage.

Swan-marking in the 14th and 15th Centuries.—Dr. W. T. Calman makes the suggestion (*Naturalist*, 1922, p. 83) that the cut which represents a Swan undergoing the process of marking—reproduced in No. 771, p. 121,—is nothing more than a caricature, but I can not think this was so, remembering how common the practice was of cutting niches on Swan's legs and beaks, as an identification of ownership, and no doubt it was found very effective. The original of this cut, which is coloured I believe, is a small miniature measuring, as Mr. Gibson of the Bodleian Library has kindly informed me, only three inches by one and a half.—J. H. GURNEY, Keswick Hall, Norwich.

Wintering of the Pied Wagtail at Newsome, Yorks.—A pair of Pied Wagtails has again passed the whole of the winter in the parish of Newsome. On the 13th and 14th January last there was a snowfall of four to five inches in depth, followed by an intense period of frost up to the 27th January. During that period, I frequently saw the birds obtaining sustenance from food placed in gardens, and poultry runs, or from the rough vegetation at the base of walls, both at Newsome and the adjoining suburb of Primrose Hill. The plumage of the birds became very much soiled, making them quite a contrast with the immigrants of this species, which were noticed on the arable land on the 10th March.—W. E. L. WATTAM, Newsome.

Pied Wagtails have been in Harrogate during the whole of the winter. On January 5th I picked up the dead body of a fine male in perfect plumage on Duchy Road. On March 2nd there was a big flock in the grounds of the Cairn Hydro. I saw them at 6 p.m. ; they were evidently new arrivals, and

were fussing about, preparing to roost in the laurels there.—
R.F.

Remains of Whooper Swan, etc., in the Peat of Lincolnshire.—Recently, during excavations in Brotherton's Brickyard, at Barrow-on-Humber, North Lincolnshire, a peat deposit was found at a depth of twelve feet beneath the surface, the material above being the familiar old Humber warp used for brick-making. In this peat occurred a number of bones; remains of three curious dark earthenware vases, hand-made, of the familiar Romano-British type; the skull of a small horse, and the frontal portions of two human skulls, together with the bone of a large bird. This last I submitted to Mr. E. T. Newton, F.R.S., who informs me that the bone represents the sacrum and part of pelvis of the Whooper Swan (*Cygnus musicus*) and not the common swan, although the two are much alike; still there are differences to enable this species to be recognised. I cannot find that this species has been recorded for the peat of either Lincolnshire or Yorkshire, although, as shown in a note on another page, pieces of egg-shell attributed to swan have occurred in the peat at Skipsea. In a chapter on the Fauna of the Peat in Miller and Skertchley's 'Fenland, Past and Present' (1878, p. 340), the Swan (*Cygnus musicus*) and Tame Swan (*C. olor*) are both given among the 'fossils hitherto obtained from the peat,' compiled by Mr. A. Bell, who informs me that the list refers to the peat of the Cambridgeshire fens. Woodward and Sherborn's 'British Fossil Vertebrata,' 1890, and Supplement 1891, include no Lincolnshire nor Yorkshire records of Swan. Oddly enough the two portions of human skull referred to above, both of which appear to be females, have the medial frontal suture, which divides the ordinary frontal bone into two. This is not at all a common feature in human skulls; and it is odd that it occurs in the two individuals represented here. There was also a human femur and a few rib bones.—
T. SHEPPARD.

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INSECTS.

Yorkshire Hemiptera-Heteroptera.—To Dr. Fordham's list (*Naturalist*, 1921, pp. 333-336, 413-417), may be added—*Asopus punctatus* Linn. (Skipwith); *Rhyparochromus chiragra* Fab. (Flixton Sand-pit); *Orthostira parvula* Fall. (Lartington). *Microphysa pselaphiformis* Curt., included on an extremely old record, has occurred to me at Kirby-in-Cleveland.—GEO. B. WALSH, Scarborough.

Developed form of Nabis limbatus Dahlb. in Yorkshire.—Among a number of Hemiptera which I collected in the Wharncliffe Woods, near Sheffield, in July, 1921, was a

specimen of the very rare macropterous or developed form of the male of *Nabis limbatus*. It was obtained by sweeping among long grass. While the undeveloped form of this species is very plentiful and widely distributed in Yorkshire, as elsewhere, the macropterous form is very rarely met with. Saunders notes it as 'exceedingly rare.' Mr. E. A. Butler has been good enough to confirm my identification.—J. M. BROWN, Sheffield.

Food of Boreus.—In *The Naturalist* for July, 1921, I stated that the food of *Boreus* was probably the juices of dead insects. Since then I have had further opportunities for observation, and am now convinced that my previous result was due to artificial conditions, there being no other food available. On several occasions since I have seen specimens chewing the bases of moss leaves, on the sap of which they seem to feed. If this is the natural food of the insect, *Boreus* is probably the only member of the mecoptera which is wholly herbivorous in diet.—C. L. WITHYCOMBE, Walthamstow, April, 1922.

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MAMMALS.

White-beaked Dolphin in Yorkshire.—At Easter, 1919, I found a White-beaked Dolphin about high-water mark, at Stainton Dale, near Scarborough. It was 8' 6" long, and a male. Unfortunately, it had suffered a slight damage about the tip of the snout. The skeleton was obtained, and is now in our departmental Museum. Mr. J. W. Clarke tells me that there is a skeleton of a Yorkshire example in the Museum at Edinburgh University, but I have found no record of any other specimen from our part of the coast.—E. PERCIVAL, Dept. of Zoology, Leeds University.

From the 'Reports on Cetacea,' issued by Sir Sidney F. Harmer, of the British Museum, it would seem that a White-beaked Dolphin occurred at Redcar in 1914, another at Skinningrove in 1915, and 'off the Yorkshire Coast' in 1917, and more recently quite a number of records for Lincolnshire and Norfolk and Suffolk.—T.S.

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BOTANY.

Claytonia perfoliata in Nottinghamshire.—Some plants of *Claytonia perfoliata* were recently seen about three miles S.E. of Blyth, in a hedge bottom on the north side of the road between Bilby Gate and Knives Hill Plantation. It will be interesting to see if this extends hereabouts. I have no information as to the occurrence or distribution of this

American species elsewhere in Nottinghamshire, though, perhaps Professor Carr may have data in this connexion. Specimens were shewn me by the discoverer, Philip H. Clarkson, a member of the Mexborough Secondary School Scientific Society.—A. A. DALLMAN.

The only Nottinghamshire station for *C. perfoliata* hitherto known is Boughton Breck, near Otterton, where it was pointed out to me by Rev. W. Becher, of Wellow, about twenty years ago. The plant is, of course, an alien.—J. W. CARR.

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GEOLOGY.

Large Ammonite at South Ferriby.—On the Humber foreshore at South Ferriby, Lincs, between Walker's Chalk Quarry and the Hall, Red Chalk, 'pink bands' and beds of the Lower Chalk are exposed, although owing to the squeezing effect produced by the weight of the Lincolnshire Wolds these beds occur at a high angle, in some cases being almost perpendicular. Where the solid rock occurs on the shore, denudation is not quite so rapid as on either side, resulting in a distinct bulge in the shore-line. At a distance of 350 yards west of the jetty and a yard from the present cliff face is a large smooth ammonite, $2\frac{1}{2}$ ft. in diameter. It is in position in the grey chalk at about 20 ft. above the bed of red chalk which is exposed nearer the low-tide mark; both ammonite and the chalk bed dipping about 45° . Large ammonites of this character are not uncommon at this particular point, but it seems desirable in this case to place its precise position on record. I may add (though perhaps unnecessarily) that its condition is such that it cannot be removed without being destroyed.—T. SHEPPARD.

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NESTING OF FULMAR PETREL IN YORKSHIRE: A NEW ENGLISH RECORD.

DURING the past two or three seasons it has been known that the Fulmar has frequented various parts of the Yorkshire Coast, and on going to press we have just heard from Mr. H. B. Booth, M.B.O.U., that the Fulmar Petrel is actually breeding on the Bempton Cliffs. On May 26th he saw a fresh unblown egg brought from the Cliff-face at Bempton, and another egg was also brought up on the same date which was sold to a Yorkshire collector. In each case the bird had to be pushed off the egg, and the bird duly annointed the 'climber' in the usual full fulmar way. There is reason to believe that a third pair is breeding, and we trust it will be allowed to rear its young.—T.S.

YORKSHIRE GEOLOGICAL SOCIETIES.

(1) **Transactions of the Hull Geological Society**, Vol. VI., part 4, for the years 1910-21. Edited by T. Sheppard, M.Sc., F.G.S., Hull, 1922, with reproductions of nine photographs and numerous illustrations.

(2) **Transactions of the Leeds Geological Association**, Part XVIII. (1913-20), published April, 1922, with six photographic reproductions and many other illustrations.

The activities of the Hull and Leeds Societies were naturally affected by the war, but the members succeeded in doing good work. The papers are mainly concerning local deposits, but many of the results are of far more than local interest.

The Transactions of the Hull Society open with a paper by the Editor on Early Humber Geography. In this, Mr. Sheppard, with a happy combination of geological, geographical and historical knowledge, criticises J. R. Boyle's 'Lost Towns of the Humber,' and argues that certain places, now destroyed, which Boyle regarded as being in the Humber, were really outside it, and that any great amount of erosion inside is unlikely.

Messrs. Crofts and Pawley describe 'Sections made during the excavation of the King George Dock, Hull.' These are generally similar to those of the Alexandra Dock, previously described. Details of the shell-bed and peat connected with the warp, and of the underlying glacial deposits consisting of boulder clays with intercalated sands and gravels, are given.

A paper on 'New Sections near Melton, North Ferriby, Yorks.,' by W. S. Bisat, is of much interest. The glacial beds are stated to be marginal deposits of the North Sea ice-sheet. A bore was sunk down to the Upper Lias. It shewed some very remarkable occurrences, including the presence of a true Carstone (the first record of this in Yorkshire), absence of the Speeton and Kimmeridge Clays, and development of the Ampthill Clay type of Corallian strata.

Under 'Notes of Excursions,' we find record of a boulder from the Holderness coast, which Dr. Milthers, of the Danish Geological Survey, recognises as Dalecarlian Grönklitt porphyrite.

Mr. J. W. Stather records 'A new section in the Oolites and Glacial Deposits near South Cave.' A chalky rubble, with no far-travelled boulders, rests on an uneven surface of Millepore oolite *in situ*. Above the rubble is a mass of displaced Millepore oolite (with possible Lias Clay beneath). This mass is 300 feet long and 12 feet thick in places, and must have been carried over the rubble by a transporting agent, presumably glacial. Mr. Stather proposes later to describe this very complex section in greater detail.

There follows another paper by Mr. Sheppard, 'Hull's Water Supply,' giving record of a boring at Dunswell, between Hull and Beverley. It passed through about 13 feet of superficial deposits, 23 feet of glacial accumulations, and 7 to 8 feet of flinty gravel resting on comminuted chalk, which itself reposed upon solid chalk.

A list of lectures and papers from 1910 to 1921 gives ample proof of the activity and varied interests of the Society.

The Leeds Transactions contain four papers and abstract of a fifth. This abstract has some useful notes on 'Creeps,' by Mr. H. Preston. One of the papers, 'Peat Problems,' by Miss E. D. Whitaker, treats of Peat from the scientific and commercial standpoints. The subject might with advantage have been treated more fully. There are some original observations on a deposit at Harwood Dale Bog, in North-east Yorkshire, and on peat-ash. The other papers are concerned with Coal Measures and Millstone Grit in and near Leeds. The first paper, by Dr. Gilligan, describes a bore hole at Meanwood through Lower Coal Measures and Rough Rock into the second grit. A photographic plate shews samples

of the Rough Rock with felspar crystals. A second paper, by Dr. Gilligan and Mr. Odling, describes some sections exposed in excavating for the Leeds Infirmary extensions. Here the Coal Measure beds are affected by four faults, which show a reversal of the curvature generally associated with normal faults. Other cases of their occurrence are cited.

A paper by Messrs. Everett and Pickering describes sections in Elland Road, Leeds, shewing the Lower Coal Measures with the Beeston bed. Vertical sections give a comparison between these beds and those of Hillidge Road about a mile to the east-north-east.

The Editorial Sub-Committee explain that owing to accumulation of material and cost of printing, 'it has been deemed necessary to curtail the subject-matter wherever possible.' Considering the interest of the material which is printed, this is a matter for regret, and one may be permitted to suggest that an abbreviation of that part of the Transactions devoted to Annual Reports and other matters would allow of insertion of more original work in future parts.—J. E. MARR.

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YORKSHIRE SCIENTIFIC SOCIETIES.

The Annual Meeting of the Rotherham Naturalists' Society was held recently, the President, Mr. E. Ollevant, in the Chair. The report of the Hon. Treasurer, Mr. J. Waite, was satisfactory. The Hon. Secretary, Mr. R. Stewart, reported that five excursions had been made, and an exhibition was held after each, in the Museum, which was well attended by the elder scholars from the Grammar School and Girls' High School. There had been lectures and papers during the winter, and microscopic and telescopic evenings, and an exhibition of nature photographs. The Society contemplates publishing transactions in which to record its deliberations and discoveries.

At the recent Annual Meeting of the Halifax Scientific Society, Mr. H. Waterworth presided, and the forty-eighth report was presented by Mr. J. H. Lumb. This showed that at the beginning of 1921 there were 212 members, that 15 had been since enrolled, and that with resignations the number now was about the same. The attendance at the meetings averaged 82.6. The natural history section had experienced a good year, the circle of microscopy embraced a small band of enthusiastic workers, while the photographic members had displayed great zeal. The Treasurer's statement disclosed that last year's small balance had been more than doubled. Mr. Waterworth contended that the Society was performing work both useful and necessary to the town. Many a young student had obtained his first impulse towards a definite scientific study through attending the Society's lectures. Mr. H. Waterworth was re-elected President. Messrs. J. H. Lumb and H. E. Greenwood were re-elected Secretaries, and Miss Percy, Treasurer. A proposition was submitted by Mr. T. W. Hanson in which the Society requested the Corporation to insert clauses in their Gorpel waterworks Bill providing for the preservation of public rights of way in the Gorpel Valley. The Mayor (Ald. T. Hey) afterwards opened an exhibition of interesting objects bearing on the work of the society. Mr. Waterworth staged physiological models and microscopical anatomical sections; Mr. S. H. Hamer, brass clock dial faces; Messrs. C. J. Spencer, G. Bunney, A. Smith and R. Rothwell, geological specimens; E. Helliwell and H. Lawson, botanical specimens; R. W. Harris, marine life; L. Alderson and H. Walsh, insects; J. H. Lumb, land and freshwater shells; H. A. Lumb, a wireless apparatus of 25 years ago, and experiments with polarised light; members of the circle of microscopy, objects under microscopes; members of the photographic section and the Hebden Bridge Society, photographs.

NEW BOOKS.

A Naturalists' Calendar, kept at Swaffham Bulbeck, Cambridge-shire, by **Leonard Blomefield** (formerly Jenkyns); edited by Sir Francis Darwin (Cambridge University Press, 84 pp., 3/6 net). We are glad to find that the publication of this old-time Calendar by the Cambridge Press in 1903 has been so popular that a further edition has been called for. There are many points of considerable interest brought out by the editor.

The Cuckoo's Secret, by **Edgar Chance**. London: Sidgwick & Jackson, Ltd., xiv. + 239 pp., 7s. 6d. net. It rarely happens that a book dealing with natural history is heralded so much by press notices, kinematograph exhibitions, etc., as has been the case with Mr. Chance's volume on 'The Cuckoo's Secret.' By now, doubtless the author's extraordinary story of the way in which he watched and photographed the Cuckoo's actions from the first to the last is well known to our readers, but many will like to have greater details, together with reproductions of the photographs, and these can now be secured.

Handbook for Field Geologists, by **C. W. Hayes**. London: Chapman & Hall, Ltd., 166 pp., 15s. net. This compact little volume, notwithstanding its high price, is evidently in demand, seeing that the third edition has been called for, which has been revised and re-arranged by Sidney Paige of the United States Geological Survey. The work is essentially written for the practical Field Geologist, of which there are greatly increasing numbers in the States, to whom, no doubt, the work will be of particular value, though English geologists will find much of interest in the tables and in many of the methods of surveying described.

The British Nature Book, by **S. N. Sedgwick**. London: T. C. & E. C. Jack, 495 pp., 12s. 6d. net. The appearance of an illustration of a Boy Scout on the title page is probably the key to the nature of the well-illustrated and remarkably cheap volume before us. In 500 closely printed pages, and by the aid of numerous coloured plates and scores of illustrations in the text, almost every possible aspect of natural history is dealt with, there being photographs, sketches, diagrams and coloured illustrations of mammals, birds, fishes, insects, shells and flowers. The book is admittedly a compilation, and the author seems to have consulted many of the standard works on the subjects dealt with.

The Edge of the Jungle, by **William Beebe**. London: H. F. & G. Witherby, 237 pp., 12s. 6d. net. The author describes the Fauna and Flora of a part of British Guiana in quite a pleasant and chatty style, although this does not necessarily imply that the volume is not soundly scientific. A perusal indicates that he has much that is new to tell us of this fascinating country. An indication of the character of the man is shown by his dedication 'To the Birds and the Butterflies, the Ants and the Tree-frogs, who have tolerated me in their ante-chambers, I dedicate this volume of friendly words.' The book is produced in Messrs. Witherby's familiar style, and, as prices are at present, is a remarkably cheap volume.

Fungi, by **Dame H. Gwynne-Vaughan**. Cambridge University Press, xi. + 232 pp., 35s. net. In the present well-illustrated volume the author gives a general introduction to Fungi in general, but specially devotes her energies to the consideration of the Ascomycetes, Ustilaginales and Uredinales. The scope of the volume is principally Morphological, but in dealing with objects so minute, morphology passes insensibly into cytology. Recently there has been a tremendous increase in the number of students of Fungi, many of whom hitherto have been hampered in their researches in consequence of their inability to obtain a reliable text-book dealing with the more difficult aspects of that science. The author in this case has carried out a piece of work which very few in the country could have prepared, and its thoroughness has been well backed up by the Cambridge University Press which has illustrated this magnificent volume by no fewer than 200 blocks.

The Forests of India, by **E. P. Stebbing**. London: John Lane, The Bodley Head, xv.+548 pp., 42s. net. Professor Stebbing has had considerable experience in connection with Forestry in India, having been for many years in the Indian Forestry Service. This practical knowledge, together with exceptional ability to present that knowledge in an entertaining fashion, results in this substantial book of 550 closely printed pages being especially readable. There can be no question that a careful study of the various forest questions in the Indian Empire adds considerably to the wealth of that important area. Professor Stebbing appears to have made himself familiar with the trees in various parts of that great country, and his chapters dealing with this subject must be of tremendous value not only to the Government but to all who are interested in Forestry in various parts of the world. The author's scientific training stands him in good stead and makes his book much more reliable than is usually the case.

Petrographic Methods and Calculations, by **Arthur Holmes**. London: T. Murby & Co., xviii.+515 pp., 31s. 6d. net. Messrs. Murby are specialising in this class of literature and certainly their latest production is one of their best. Just now, when so much attention is being devoted to the mineralogical constituents of the rocks, the appearance of this magnificent volume, with its carefully prepared chapters dealing with Petrology: Its Scope, Aims, and Applications; The Specific Gravity of Minerals and Rocks; Separation of Minerals; Optical Examination of Crushed and Detrital Minerals; Examination of Detrital Sediments; Preparation of Thin Sections; Microchemical and Staining Methods; Textures and Structures of Igneous and Metamorphic Rocks; Chemical Analysis and their Interpretation; and Graphical Representation of Chemical Analysis; is most appropriate. The author is well known, and we predict a successful career for the volume. At the end are several plates with rock sections and careful descriptions thereof.

The Naturalisation of Animals and Plants in New Zealand, by **The Hon. G. M. Thomson**. Cambridge University Press, 607 pp., 42s. net. For the first time, with the aid of the house of Macmillan and the author, we are in a position to form an idea of the extraordinary Flora and Fauna of New Zealand. In this substantial volume the author has gathered together a detailed description of the Fauna from the highest to the lowest orders, and the Flora is similarly perfect and complete. The author's chapter on the Interaction of Endemic and Introduced Faunas is a remarkable contribution to the distribution of animal and plant life, albeit that the author considers that the effect of foreign animals and plants into the land have been so far-reaching and so complex that it is impossible to present any summary of them, and all that can be done is to show various aspects of the question and to consider facts in detail. The author acknowledges the help of various specialists he has consulted, and there is a good Bibliography and an index to the animals and plants.

Vol. I., No. 1, of **The Bulletin of the Hill Museum**: a Magazine of Lepidopterology, by **Messrs. J. J. Joicey and G. Talbot** (200 pages, 30/- net) is to hand. We must admit that we received a surprise on examining this lavish publication, with its wealth of half-tone illustrations and plates. From the photographs reproduced of the staff at the Museum, as well as the Museum itself, it would seem that this particular institution is one of an altogether remarkable character. We only hope that the sale of this publication will recompense, to some extent, the enormous outlay which has obviously been necessary to produce it, and that the particular source of income will long be forthcoming in order to publish future Bulletins. The Bulletin contains: Introduction; Bibliography of Previous Publications of the Hill Museum; Euploeines Forming Mimetic Groups in the Islands Key, Aru,

Tenimber, Australia and Fiji; Report on Collections made by Mr. T. A. Barns on an Expedition through East Central Africa; Descriptions of the New Forms of Lepidoptera from the Island of Hainan; and an Index.

A Laboratory Manual for Comparative Vertebrate Anatomy, by **L. H. Hyman**. Chicago: The University Chicago Press, xv. + 380 pp., \$2.50 net. The Great American Universities are following the example of those in Britain in publishing standard works for use of teacher and student alike. In the present publication, Mr. Hyman brings together a valuable text-book containing thirteen chapters dealing with General Considerations on Animal Form; The Phylum Chordata; General Study of Typical Chordates; General Features of Chordate Development; The Comparative Anatomy of the Integument and the Exoskeleton; The Endoskeleton; The Comparative Anatomy of the Vertebral Column and Ribs, of the Girdles, the Sternum, and the Paired Appendages; of the Skull and the Visceral Skeleton; of the Muscular System; of the Coelom, Digestive and Respiratory Systems; the Circulatory System, the Urogenital System, the Nervous System and the Sense Organs. Appendices deal with pronunciation and derivation of technical words and the preparation of materials. The illustrations are numerous and clear.

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CORRESPONDENCE.

OTTERS AND BIRDS.

With regard to Mr. F. D. Welch's note on 'Otters Destructive to Birds' (p. 76): in the case of the grebes at Fairburn, otters are not the culprits. The gamekeeper (J. Fox) tells me that he has seen none for some years. The otter being a nocturnal feeder, would have to disturb the old grebes, which would be covering the young amongst the reeds. I think Mr. Fortune's answer the correct one.—**W. G. BRAMLEY**.

EARLY RECORDS OF CUCKOO.

In *The Naturalist* for May is a note recording the cuckoo on March 29. Mr. Riley Fortune remarks that this is a phenomenally early record, and that the previous earliest is April 4th. Mr. A. House, of York, and I both saw and heard the Cuckoo when within twenty yards of it at Fangfoss, on April 1st, in either 1912 or 1913. The record is with those of the York Naturalists' Club, and appeared in their ornithologist's report for the year in which it occurred.—**CHAS. F. PROCTER**, Hull.

In *The Naturalist* for 1894, page 157, there is an earlier record of a Cuckoo being heard in Bilton Banks, near Harrogate, on March 27th, 1894. There is, however, little reliance to be placed on these early records of birds which have only been heard. Many boys frequent the wood at Bilton Banks, and they, like myself when a boy, frequently amused themselves by calling 'Cuckoo,' often in a very natural manner. Unfortunately, records in local societies' publications are not always available to the general public, consequently, interesting ones like this of Mr. Procter's may easily be overlooked.—**R.F.**

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It is interesting to notice that the Yorkshire Naturalist's Union has just held its three-hundredth meeting.

Sir Ernest Rutherford, F.R.S., has been elected President of the British Association for the Liverpool meeting in 1923.

Mr. S. E. Harrison, of the Cheltenham Library, Museum and Art Gallery, has been appointed Curator of the Bowes Museum, Barnard Castle.

We notice that Sir Charles Parsons, who was President of the British Association at Bournemouth, has given £10,000, which he places unreservedly at the disposal of the Council of the British Association for the advancement of Science.

NEWS FROM THE MAGAZINES.

Dr. A. Landsborough Thomson writes on 'The Migration of British Swallows' in *Nature* for March 16th.

J. H. Gurney contributes his 28th Annual 'Ornithological Notes from Norfolk' to *British Birds* for May.

'Is the Squirrel a native Irish species?' is the title of a paper by R. F. Scharff in *The Irish Naturalist* for May.

Messrs. Bagnall and Harrison continue their studies in 'New British Cecidomyiidae,' in *The Entomologist's Record* for April.

Conquest for May refers to Giant Bridges, Burglar-proof Rooms, The Winter Sleep of Animals, and several other topical subjects.

'The Characteristics of Living Creatures,' and 'The Romance of Chemistry,' appear in the well-illustrated *Romance of Science*, part 13.

No. 9 of *The Outline of Science* has a fine paper on the Nesting Habits of Birds, and a chapter on Mammals, both of which are well illustrated.

Part 12 of *The Outline of Science* (G. Newnes, Ltd., 1/2 net) contains 'Biology and the Beginning of Life,' by Julian Huxley, and other interesting matter, well illustrated.

Dr. G. Enderlein writes on 'A Scaly-winged Psodid, new to Science, discovered in Britain; and a New Fungus-feeding Gall-Midge,' by F. W. Edwards, appear in *The Entomologist's Monthly Magazine* for May.

The Lancashire and Cheshire Naturalist, published April 24th, is full of valuable papers on Botany, Birds, Crustaceans, Lepidoptera, Hemiptera, Myriopoda, Isopoda, Diptera and Hymenoptera of the counties covered by the title.

Dr. A. Smith Woodward writes on 'The Problem of the Rhodesian Fossil Man'; Sir James G. Frazer on 'The Scope and Method of Mental Anthropology'; and A. G. Thacker on 'The Geological History of the Primates,' in *Science Progress* for April.

In *The Geological Magazine* for April, Dr. F. L. Kitchen and Mr. J. Pringle write on 'The Overlap of the Upper Gault in England,' and on 'The Red Chalk' of the Eastern Counties. There are also records of Rhomb-porphry and Laurvikite near Ellon, Aberdeenshire.

'The Blue Diamond Mystery,' by R. A. Freeman in *Pearson's Magazine*, for May, 1922, is solved by the villain picking up a specimen of *Clausilia biplicata* and the detective being able to recognise the snail, and knowing from it that the man must have been at Hammersmith!

The New Phytologist for April contains, among others, the following: 'Physiological Studies in Plant Anatomy,' by J. H. Priestley; 'The Physiological Relation of the Surrounding Tissue to the Xylem and its Contents,' by J. H. Priestley and Dorothy Armstead; and 'A Critical Study of Certain Unicellular Cyanophyceae, from the point of view of their Evolution,' by W. B. Crow.

In *The Geological Magazine* for March, Prof. P. F. Kendall severely criticises a paper on English Eskers by Dr. J. W. Gregory; Mr. G. W. Lamplugh does not quite agree with Drs. Trechmann and Woolcott's conclusions with regard to the raised beach at Easington (Durham); Mr. L. M. Parsons continues his notes on Dolomitization in the Carboniferous Limestone of the Midlands; and Mr. C. Edwards concludes his notes on the Carboniferous Limestone Series of West Cumberland.

The Journal of Ecology, Vol. IX., No. 2, edited for the British Ecological Society by A. G. Tansley, is particularly well produced and contains some remarkable memoirs, most of which are well illustrated. Among them are 'The Woodlands of Ditcham Park, Hampshire (Studies of the Vegetation of the English Chalk),' by R. S. Adamson; 'Stratification and Hydrogen-Ion Concentration of the Soil in Relation to Leaching and Plant Succession, with special reference to Woodlands,' by E. J. Salisbury; 'A Suggestion as to Factors influencing the Distribution of Free-floating Vegetation,' by W. H. Pearsall; 'On the Mycorrhizas of *Pinus silvestris* L., and *Picea abies* Karst.: a Preliminary Note,' by E. Melin.

The Selborne Magazine, No. 349, covering the period February to May, contains a number of interesting natural history items, including London Birds in 1921, Bees and Snail Shells, Woodpeckers in London, etc.

Natural History: the Journal of the American Museum of Natural History, is a sumptuous publication, and No. 1 of Vol. XXII., recently issued, contains, among many other papers, the following: 'Phosphorescent Animals and Plants,' by U. Dahlgren; 'The Birth of Sculpture in Southern France,' by H. F. Osborn; 'Some Features of Museum Progress during the past Fifty Years,' by F. A. Lucas; 'Biological Work on Mount Desert Island,' by R. W. Miner; 'Shackleton,' by R. C. Murphy; 'A Visit to Rapa Island in Southern Polynesia,' by R. H. Beck; 'The Unforeseen in Indian Vocabulary Work,' by C. H. Merriam; 'Decrease of Fur-bearing Animals in Alaska,' by E. W. Nelson; and 'Rains of Fishes and of Frogs,' by E. W. Gudger.

Man for April contains a note entitled 'The Ice-Age and Man: A Note on Man, 1922, 5.' In this Mr. J. R. Moir states that 'As regards the detritus-bed beneath the Red Crag, I would point out that, in view of the larger number of striated flints which it contains, and the fact that a considerable series of foreign rocks occur with these flints, it would seem not unreasonable to assume that the deposit in question is intimately connected with glacial conditions. After a very careful examination of large numbers of striated flints from beneath the Red Crag, I have come to the conclusion that the scratches were imposed after the specimens were flaked and patinated, and that, in consequence, the pressure to which these flints were subjected has had nothing to do with the flake-scars to be seen upon them.'

—: o :—

The Guide to the Prehistoric Room of the London Museum (12 pages, 3d.) has reached its third edition.

The Ministry of Agriculture and Fisheries has issued a Report of the Methods of Fish Canning in England (25 pp., 2/6 net). It deals exhaustively with the subject, and also contains information of value to Zoologists.

The death is announced of Professor G. S. Boulger, at Richmond, Surrey, in his sixty-ninth year. Professor Boulger took an active part in the work of the scientific societies in the south, and was the author of a number of popular books on botanical and geological subjects.

The Report of the Norwich Museum includes a reference to the activities of a society known as 'The Friends of the Museum,' which subscribes funds for the purchase of specimens which otherwise would not be obtained for the collections. In this way our Norwich friends receive considerable assistance.

With the title 'A Peep into the Past,' a description is given of a fine pair of antlers of the Red Deer recently found at Withersea, in No. 1 of 'Our Magazine,' which is the magazine of the Withersea Council School. Another article is entitled 'Sport Among the Girls,' so that the staff is doing its best to make things attractive!

The Annual Meeting of the Hull Geological Society was held recently. The officers' reports showed the Society to be in a prosperous condition, and that very good geological work had been done, and an interesting volume of transactions containing noteworthy local matter had been issued. Prof. Percy F. Kendall, M.Sc., was elected President; Dr. Walton, F.G.S., Messrs. G. W. Lamplugh, F.R.S., Alfred Harker, LL.D., F.R.S., Vice-Presidents; Mr. T. Sheppard, M.Sc., Editor; Mr. C. Thompson, B.Sc., Recorder; Mr. W. Ennis, B.Sc., Excursion Secretary; Mr. J. W. Wilson, Treasurer; Messrs. J. W. Stather, F.G.S., and W. H. Crofts, Secretaries. A good programme of field work was especially arranged for the summer months, with a view to the meeting of the British Association in Hull in September next.

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AND

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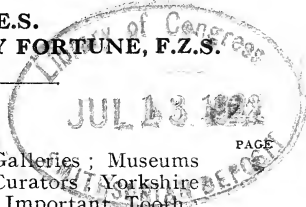
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The 301st Meeting will be held at FILEY

For the Investigation of the District,
SATURDAY, JULY 15th, 1922.

Train Service.—There will be an Excursion from Leeds to Scarborough per North Eastern Railway on this date. By the courtesy of the District Passenger Manager, arrangements will be made for bookings to be given from Leeds and York to Filey by this train. Details are not yet published, but it is expected the excursion will leave Leeds New Station at about 7-30 a.m., and York at about 8-20 a.m., and the fares will be 10/6 and 6/9 respectively.

The passengers for Filey will change at Seamer in each direction, and arrangements will be made for the 9-55 a.m. ex Scarborough to stop at Seamer to pick up passengers for Filey, and on return the 6-22 p.m. ex Filey will stop at Seamer to set down passengers, who will join the excursion there, which will leave Washbeck excursion station, Scarborough, at about 6-50 p.m.

There will be a day excursion from Hull to Filey on this date, and bills announcing the same will be issued in due course. If there are twelve or more visitors from Scarborough, they will be able to obtain return tickets at a single fare and a third on giving three days notice to the Booking Office.

The Tides will be favourable for the investigation of Marine life on the Brig during the time at disposal. High Tide, at 9 a.m.

Routes.—The party will divide on arrival of the Excursion from Hull. Those prepared for a long rough walk will examine the cliffs south as far as Speeton. The other party will investigate the rocks in the vicinity of the Brigg, and the cliffs to the north thereof.

Maps and Books.—Sheets 95 S.W. and S.E. of the one-inch Ordnance Survey include the district to be investigated. J. F. Robinson, "East Riding Flora"; T. Sheppard, "Geological Rambles in East Yorkshire"; Dr. W. G. Smith's paper on "The Vegetation of Ponds at Filey," *The Naturalist*, 1903, p. 389; *Y.N.U. Circulars* Nos. 119, 172 and 251.

Headquarters.—The School-room, St. Oswald's Church. The use of this room has been kindly granted by the Vicar (Rev. Canon Cooper, M.A.).

Tea.—Will be served at Headquarters at 4-45 p.m. Plain Tea, with cakes, 1/6; with fruit, 2/-; ham and tongue, 1/- extra. Catering will be done by F. W. Birkett, 1 John Street, Filey, who has offered to obtain accommodation for Members and Associates desiring to remain in Filey for the week-end; application for such accommodation should be made immediately.

Meeting.—At 5-30 p.m. for general business and Section reports.

Geology.—Filey is a convenient centre for the investigation of the unrivalled series of Oolitic rocks which occur in the cliffs to the north, and for the exceptional sequence of cretaceous beds which are immediately to the south, both series being more or less enveloped in various deposits of Pre-glacial, Glacial, and Post-glacial age. In recent years particularly, each of these three series has presented problems of exceptional interest, and probably no time is more opportune than the present for a re-investigation of the beds. Within a few miles of Filey may be examined sections such as rarely occur anywhere in the country between the lower Oolite and the comparatively modern peat deposits. The whole area is particularly attractive from the collector's point of view as well as to the student of Stratigraphy.

Botany.—Mr. J. F. Robinson writes :—

The part of the coast near Filey, which lies to the south of the town, is in the East Riding of York. (V.C. 61), and will be by far the best route for the botanists to take. At the ravine in the Boulder Clay, generally known as " Primrose Valley," many interesting plants are crowded together in a somewhat peculiar association. Amongst other flowering plants, ferns and horsetails, the following may be noted :—*Viola hirta*, *Polygala serpyllacea*, *Geranium sanguineum*, *Genista tinctoria*, *Agrimonia Eupatoria*, *Rosa spinosissima*, *Sanguisorba officinalis*, *Poterium Sanguisorba*, *Spizæa Filipendula*, *Serratula tinctoria* and *Equisetum maximum*. A little farther along the coast, at a distance of about one-and-a-half miles from Filey, one comes to the " Flat Cliff," a kind of undulating undercliff caused evidently by slipping down of the adjoining Boulder Clay. Here there are several small ponds in which many aquatic plants luxuriate, notably :—*Ranunculus heterophyllus*, *R. Drouetii*, *R. Flammula*, *R. Lingua*, *Hypericum tetrapterum*, *Apium inundatum*, *Menyanthes trifoliata*, *Pedicularis palustris*, *Iris Pseudacorus*, *Carex ampullacea*, *Equisetum palustre*, *E. limosum*, etc. In drier ground will be found *Silauus pratensis*, *Stachys Betonica*, the orchidaceous plants *Listera ovata* *Habenaria viridis*, *Orchias mascula* and *Morio* with several sedges, *Eriophorum* (Cotton Grass), and grasses, including *Aira caspitosa*, etc.

Vertebrate Zoology.—Mr. E. W. Wade writes :—

Probably the cliff-breeding birds will claim most attention. At the time of the visit the chalk cliffs to the south will still be full of Guillemots, Razorbills, Puffins and Kittiwakes, and to the north Herring Gulls and Cormorants will still be busy with family matters. Other interesting birds to be noted are Common Bunting, Stonechat, Rock Pipit and Red-legged Partridge. Cuckoos are usually plentiful on the rough ground to the south, and here and in the ravines small bird life is plentiful—but they are sadly persecuted in the nesting season by the youths of the neighbourhood. House Martins and Tree Sparrows nest in the cliffs, as also do Rock Doves, Stockdoves, Kestrels, Jackdaws and Carrion Crows. A look-out should be kept for the Peregrine Falcons and the Fulmar Petrels. A pair of Oystercatchers usually frequent the bay, and it is quite possible that at this date Dunlins and Turnstones may be seen on the Brig. Only the commoner species of mammals, reptiles and amphibians are recorded.

Invertebrate Zoology.—Mr. T. Stainforth writes :—

COLEOPTERA: The boulder clay cliffs should at this season be rich in beetle life. Many forms of *Bembidion* may be found, including, among others, *anglicanum*, *saxatile*, *affine*, etc. *Nebria livida*, which lives in abundance in the crevices of the cliffs, will certainly be obtained by detaching loose chunks of the clay. The seaweed and other rubbish left on the sands will repay careful examination, in spite of the monotonous abundance in it of such forms as *Cafius xantholoma* and *Cercyon littoralis*. Some of the microscopic Trichopterygidæ are likely to occur, as well as species of *Atheta* (*Homalota*), and there is a sporting chance of finding *Aëpus marinus*. The crevices of the rocks between tide marks at the Brig afford a likely habitat for *Micralymma marinum*.

ARACHNIDA: Arachnologically Filey is almost *terra incognita*. The records are few, and form only a small percentage of the species of spiders which certainly occur in such a promising district. Halophilous forms should be sought for at the foot of the cliffs, and myrmecophilous species in the ants' nests, which are particularly abundant on the " Flat Cliff."

Reports of this meeting should be sent to the Hon. Secretaries, Yorkshire Naturalists' Union, The University, Leeds, not later than August 1st.

NOTES AND COMMENTS.

TYPE AMMONITES.

S. S. Buckman's Monograph on *Type Ammonites* continues to appear. Part XXXII. contains 20 plates, illustrating 17 species, of which 9 are new. Since the completion of Vol. III. at the end of 1921, Mr. Buckman has given us only plates without explanatory text. We may, however, draw certain inferences as to the development of his ideas from the notes incorporated in the plate-titles. We find that the majority of ammonites figured belong to two geological 'ages'—Proplanulitan and Macrocephalitan. The former is the time of deposition of the Kellaways Clay and Kellaways Rock of England, and a tabulation of its hemeræ and faunas was given a year ago,



'*Macrocephalites* cf. *arcticus*, Newton. "South Cave, S. Yorks.; Kellaways Rock," siliceous, ironshot. Mr. Frank Petch, coll.; S. 33, 45, 72—; 44, 45-5, 65; 22 + —; size 51; ribs 22; max. c. 55. Fam. *Macrocephalitidæ*, nov. *Catacephalites durus*, nov. *Macrocephalitan*, *Catacephalites*; Genotype; Holotype. Cf. CCLXXIII.'

though apparently an additional hemera (*Galilaeites*) will have to be interpolated now. The Macrocephalitan age is evidently the old *macrocephalus* zone, represented stratally partly by Cornbrash and partly by Kellaways Rock: in this the author recognizes at least five hemeræ, though at present he gives no hint of their relative date. We are kindly permitted to reproduce of one of the Yorkshire species, *Catacephalites durus*, n.sp. from South Cave: this is dated as Macrocephalitan, hemera *Catacephalites*. The plain meaning of this statement is that the 'Kellaways Rock' of South Yorkshire is, in part at least, older than any part of the 'Kellaways Rock' of

Scarborough : probably it is altogether older, as the ammonites of the two places have hardly anything in common. Two other Yorkshire species are figured : *Nautilus chalcedonicus* Young and Bird, from Thornton, and *Ammonites putealis* Leckenby, from Scarborough. We note two misprints—*Morriceras* for *Morrisiceras* on Pl. 285, and *Condioceratan* for *Cardioceratan* on Pl. 295c ; while the new trivial name *comma* is not given its due prominence in Clarendon type in the Contents.—A.M.D.

ART GALLERIES.

We learn from the press that at a recent meeting of the Society of Arts, Mr. L. Haward, of the Manchester Art Gallery, read a paper on the 'Lack of definite policy in the selection and display of many provincial collections of pictures and antiques.' Judging from the newspaper reports, the address was very similar to that given by Mr. Haward at the Museums Association Conference at Paris last year, when it cut no ice. It has since appeared in *The Museums Journal*, but has caused no great stir there, simply because, while Mr. Haward may be an excellent Art Curator, he knows nothing of museums. His ideas thereon are at least half a century old, and his opinions, consequently, have received the consideration they deserve at the hands of Museum Directors.

MUSEUMS AND THEIR CONTENTS.

Judging from the following press report, his knowledge of provincial collections, if not extensive, is at least peculiar. He says, 'Some of these are "graced with the courtesy title of museums, but are in reality little more than glorified curiosity shops." Of worthy collections, however, he instanced the Burne-Jones drawings, and works of the pre-Raphaelite school at Birmingham ; the paintings by old masters in the Roscoe Collection at Liverpool ; the work of the Norwich School at Norwich ; the Wilson, Millais, and Madox Brown pictures at Manchester ; the English glass and silver in the same gallery ; the historical collection of local pottery at Burslem and at Leeds ; the Wrights at Derby ; the miniatures at Bath ; and the representative examples of the best English painting of the last hundred years at Bradford, Oldham, Newcastle, and other galleries.' This particular selection would be amusing were it not so pathetic.

MUSEUMS AND LECTURES.

Following on the report, we learn that 'where many of our museums failed, he said, the cause of failure was that the local town council often accepted *en bloc*, without any discrimination, whatever any wealthy citizen of omniverous taste cared to bestow upon it. This was fatal to the value

of any art collection, and no success could be achieved unless the directors of such institutions stood fast by two fundamental axioms: "Show things to the best advantage; and have only the best to show." As to what had been done in Manchester to make their galleries more attractive educationally he quoted the fact that special lectures are given, exhibitions held, special parties conducted round, and even elementary talks on art provided for as many as 1000 children per day.' These are the sort of criticisms we heard when the Museums Association was founded, somewhere about 30 years ago. It is also encouraging to learn that Mr. Haward has at last realized the advantage of lectures to scholars, and has introduced the system in his gallery at Manchester. But had his knowledge been as great as his innocence, he would have known that many of the provincial museums he so unjustly criticises have been giving lectures to scholars, probably since the day Mr. Haward was born—if not before.

ART CURATORS.

The report goes on to say that 'Sir Whitworth Wallace, Director of Birmingham Art Gallery and Museum, said they would never have the right sort of art collections until they got a very different class of curators from that to which the provinces has been accustomed. The curator must be a man of enough taste and culture to be a dictator. "It is not what you accept," he added, "that will make your art gallery, but what you have the courage to refuse."' As in this case Sir Whitworth confines his remarks to Art Gallery Curators, (and, though a Museum Director, makes no comment on the ways of museums, as such), we are able to endorse his remarks, and say 'Amen,' betimes, lest the devil cross our prayer.

YORKSHIRE GLACIAL GEOLOGY.

There has been some discussion—after the style of those of a quarter of a century ago, between the last of the 'submergers' and the new school of land-ice glacialists—in *The Geological Magazine* recently, as the result of a somewhat unexpected paper by one of our leading geologists, Prof. J. W. Gregory. Prof. Gregory's generalisation, as was the case with Prof. Bonney's Presidential Address to the British Association at Sheffield in 1910,* and a certain memoir dealing with the drainage system of East Yorkshire, published in 1885, puts back the clock of geological progress at least twenty years. It seems unfair that after the hard work of a whole band of earnest workers—amateur and professional—a paper on broad general lines by a prominent geologist, who admittedly is as unfamiliar with the work in the field as he is

* See *The Naturalist*, 1910, pp. 351-357.

with the literature on the subject, should be printed in one of our leading journals.

EAST YORKSHIRE ESKERS.

Under 'S. and S.E. Yorkshire,' Prof. Gregory, in his paper on 'The English Eskers' (*Geol. Mag.*, 1922, pp. 30-34), says:— 'E. and S.E. Yorkshire—An "esker-like" ridge resting on the Upper Boulder Clay in Stanghow Moor, Eskdale, occurs on the flanks of the Cleveland Hills. Better developed eskers have been described in Holderness (J. Philips; Mem. Geo. Survey). The best known example is at Brandesburton, east of Beverley, and outside of Carvill Lewis' line of E. Yorks. terminal moraine. It contains marine shells. The course and form of this ridge is well shown on the 6" map. It is about 2 miles long, and includes Barf Hill, Coneygarth Hill, and Gildholm Hill. I have not visited* it, but its position suggests its origin as a Kame marginal to the North Sea ice. A more detailed account of this formation is desirable.' For this area, then, Prof. Gregory relies upon the geological map, and upon 'Phillips' (who died in 1874); upon the Geological Survey Memoir, published in 1885. Of the whole army of workers who have described these gravels—Carvill Lewis, Fox-Strangways, Kendall, Lamplugh, Stather, Sheppard and others, whose memoirs and papers are carefully indexed in the Bibliography of Yorkshire Geology, published in 1915 (from which Prof. Gregory, in other instances, quotes, so presumably has consulted), not a word is said! The remarkable evidences produced by the sections made in the far finer Holderness Hills at Burstwick and Kelsey Hill, Keyingham, and the enormous amount of evidence they produce as to their morainic origin, are not even referred to. All we are told is that the Professor 'has not visited' the area. He also has evidently not consulted the somewhat extensive literature of the last quarter of a century, yet we are asked to accept his generalisations, and, to crown all, we are calmly told that 'a more detailed account of their formation is desirable.' East Yorkshire, in the past, has provided so many pit-falls for those who attempt to unravel its history by studying old maps—not themselves always reliable—that we should have thought Professor Gregory, competent geologist that he is, would at least have taken the trouble to have visited our area, instead of sitting in his chair at Glasgow and telling East Yorkshire Geologists what he thinks is the interpretation of features shown on maps.

AN IMPORTANT TOOTH.

Referring to our note on page 180 of *The Naturalist* for June, *The American Museum Novitates*, No. 37, which we

* The italics are ours.

have recently received, contains a note on 'Hesperopithecus, the First Anthropoid Primate found in America,' by Henry Fairfield Osborn, in which, quite rightly, the author states, 'It is hard to believe that a single small water-worn tooth, 10.5 mm. by 11 mm. in crown diameter, can signalize the arrival of the anthropoid Primates in North America in Pliocene time. We have been eagerly anticipating some discovery of this kind, but were not prepared for such convincing evidence of the close faunal relationship between eastern Asia and western North America as is revealed by this diminutive specimen. The entire credit for the discovery belongs to Mr. Harold J. Cook, consulting geologist, of Agate, Nebraska, who has been contributing for many years to our knowledge of the extinct fauna of Nebraska through both his discoveries and his writings.'

RED CRAG FLINTS.

In *Man* for June, Mr. S. Hazzledine Warren, has a paper on 'The Red Crag Flints of Foxhall,' in which he states, 'As a result of tedious and careful digging with small hand tools, I have seen the rostro-carinates, the Foxhall type of flakes with edge trimming, pseudo-borers, pseudo-scrapers, spur implements, single notches, double notches, and many more, all in the actual process of manufacture by the movement-under-pressure of one stone against another. There have been difficulties and delays in the working of the Grays site, but I still hope to obtain a larger amount of material that will more adequately illustrate the whole series of pseudo-implements, their remarkable systematic grouping (so deceptively suggestive of human intelligence), and their range of variation. The series that I have already obtained is more than enough to be conclusive to myself; but then I have had the advantage (which is not shared by any one of my opponents) of the first-hand investigation of experimental movement-under-pressure, combined with first-hand digging in the best sub-soil flaking site that is yet known. I do not expect the opinions of others to be influenced by my own, but I look to the enthusiasm and perseverance of my opponents to prove more and more specialised and advanced human industries in earlier and earlier geological formations, until the conclusion is forced upon them that there must be something wrong. I believe that in this way (and in this way only) they will come to realise for themselves that their standard of human workmanship is a false one, and will have to be revised, not only with respect to the eoliths, but also with respect to some supposed implements of the admitted human period.'

THE YORKSHIRE FULMARS.

We take the following letter, signed 'Naturalist,' from the correspondence column of the *Yorkshire Post* of 30th

May :—‘ Your special correspondent this morning gives “ An Ornithological Record ”—and, unfortunately, the record is a bad one. For years Yorkshire Naturalists, by the aid of their Wild Birds and Eggs Protection Committee, have been subscribing large sums of money towards protecting rare breeding species and encouraging others. The Fulmar has been known as a visitor to our grand cliffs for a few years, and at last, at least three pairs have honoured us and delighted us by nesting at Bempton. With what result? The only egg laid by each of two pairs was taken on Friday, probably within a few hours of being laid, and, no doubt, the third egg will have been taken before this letter gets into type. Yet the “ climmers ” receive money from the Yorkshire Wild Birds and Eggs Protection Committee to protect the birds. The Fulmar may have “ made history ” by nesting at Bempton, but what scientific or other gain has there been if the eggs are taken directly they are laid? Are we likely, in the circumstances, to see the Fulmar here again? ’ We understand that ‘ Naturalist ’ also commented upon the fact that as the name of the person taking the egg, and also the name and address of the one purchasing it (in one instance), were given in the press, possibly something might be done to prevent a recurrence of this unsatisfactory business.

EARLY BRITISH TRACKWAYS.*

The author of this book sees Guide Posts in Trees, Sighting Points in Hills, Indicators in Stones, and Leys in everything. The book is based on an address to the Woolhope Naturalists’ Field Club, in which the author endeavoured to show that all our archæological difficulties could be removed as a result of his discovery, of which he admits he would want verification if any person had told it to him. The author’s point is that throughout the country the mounds, tumuli, notches in the mountain side, boulders, and even ponds and trees are planted along lines to indicate the direction of ancient trackways. He bolsters up his theory by photographs of Church towers, fords, castles, camps, crosses, causeways, etc. He finds new meanings in all sorts of words, but the key to his discourse is the word ‘ ley,’ which is the name of his sighting line, and in his opinion the name ley in a place-name is some indication of this. He says ‘ The fact of the ley is embedded in the rural mind. A country man in directing your path will invariably bring in the now misleading, but once correct, “ keep straight on.” It was once absolutely necessary to “ keep straight on ” in the ley, for if you did not you would be de-leyed on your journey. This is not said as a pun, but, as in some succeeding sentences, to point out the place of the

* By Alfred Watkins. Hereford : Watkins Meter Co., 41 pp., 4/6 net.

key in the evolution of our language.' He gives 'hints to ley-hunters,' and so on. The author is evidently very enthusiastic in the line of research he has taken up, but we must admit we are not converted.

A MISCELLANY,

The Gilbert White Fellowship has started to publish a *Miscellany* (4 page pamphlet), one page or part of one of which is occupied by a block. It seems to be issued monthly at 3d., and presumably it answers a purpose, though we do not quite like to suggest what that is. These publications remind us somewhat of the Bulletin issued in connection with the South Eastern Union of Scientific Societies. The editor is presumably a humourist, as he asks for exhibits; those 'from a foraminifer to an iguanodon will be acceptable. In the event of anyone bringing or sending the latter, they must prepay the carriage.' We do not see why the carriage should be prepaid if the people bring it. We learn of the unfortunate circumstances that 'the stone seat which the Fellowship wishes to give to Selborne as a memorial has not yet become a *fait accompli*. Enough money has not yet come in. This is very unfortunate. The seat has been artistically designed. It will certainly be most useful to the village. I think that some seats on the Plestor are badly needed.' A certain 'demonstration was intensely interesting, and was listened to with rapt attention.' Another humorous paragraph reads 'Timothy, the tortoise, appeared at the tea-table on Founder's Day, and we must congratulate the artist, Miss Streeter, who moulded Timothy's form in marzipan confectionery, and mounted it on cake. We noticed that, at the close, the cake had completely gone, but Timothy remained intact; apparently a case of protective mimicry'; and there is a dissertation on the question 'Why are scientific people generally so unmusical.' There is a question about this. The editor occasionally uses French words, but gets mixed with his spelling.

AND A PARODY.

Bearing on this, a correspondent sends the following:—

A tortoise, by name Timothy,
 Was illustrating Mimicry;
 His form was put upon a cake;
 Of almond paste it was a fake.
 The cake was eaten, that is 'sartin,'
 The fact is vouched for by a Martin,
 Who did not eat nor sell any
 But put it in Miscellany!

PRESENTATION TO PROF. KENDALL.

It is intended that the gift to Prof. Kendall shall take the form of an Illuminated Address containing the names of all the Subscribers (in alphabetical order), together with a cheque for the balance of the Fund, which it is expected will be approximately £200. The presentation will be made at a meeting in the Library of the Philosophical Hall, Leeds, on Wednesday, July 5th, at 4 p.m. The chair will be taken by Dr. D. Forsyth. The address will be presented by Mr. Godfrey Bingley, and the cheque will be handed over by the Hon. Treasurer (Mr. J. E. Bedford).

THE LAW AND EGGS.

We learn from the press that at Gainsborough recently two men were charged with taking plovers' eggs on May 11th. Defendants pleaded not guilty, and said the eggs were gulls' eggs. They went to the gull ponds at Laughton, and secured the eggs from the side of the ponds. They had to go knee deep into the water to get them. The Chairman expressed a doubt as to whether the eggs produced were plovers' eggs. Defendant: 'We will agree to an adjournment to have the eggs hatched in an incubator to prove whether they are plovers' or gulls' eggs. They were large white birds with black heads that were sitting on the nests, and they attacked me when I went to the nest.' The Chairman said there was *nothing in the evidence to prove that the eggs were really plovers' eggs*, and dismissed the case!

FALCONS SHOT IN CUMBERLAND.

The Yorkshire Post of June 17th records that for generations a pair of Peregrine Falcons has nested near Ravenglass, and was protected by the late Lord Muncaster, a bird lover, who turned the district into a paradise of rare species, and regarded the Falcons as being worth especial care. Now, with the passing of their protector, havoc is being wrought among the wild life of the neighbourhood, and four young Peregrines and one of the parents have been shot. Other species have been ruthlessly destroyed, rare birds like the Buzzard and the Raven, and useful birds like the Owl, notwithstanding that, together with the Peregrine, they are all on the schedule and protected all the year round. At Ravenglass there grew up under the fostering care of Lord Muncaster the largest gullery in the kingdom, where, in addition to Black-headed Gulls, many rare sea and shore species nested.

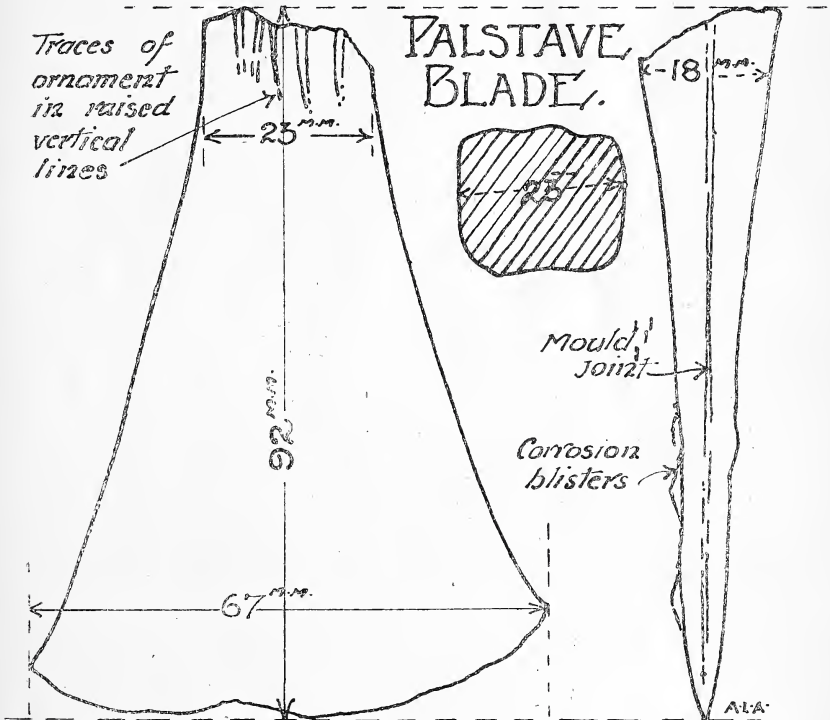
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Since its foundation the British Association has granted £83,000 for the advancement of Science.

HOARD OF BRONZE AXES FROM WINDSOR.

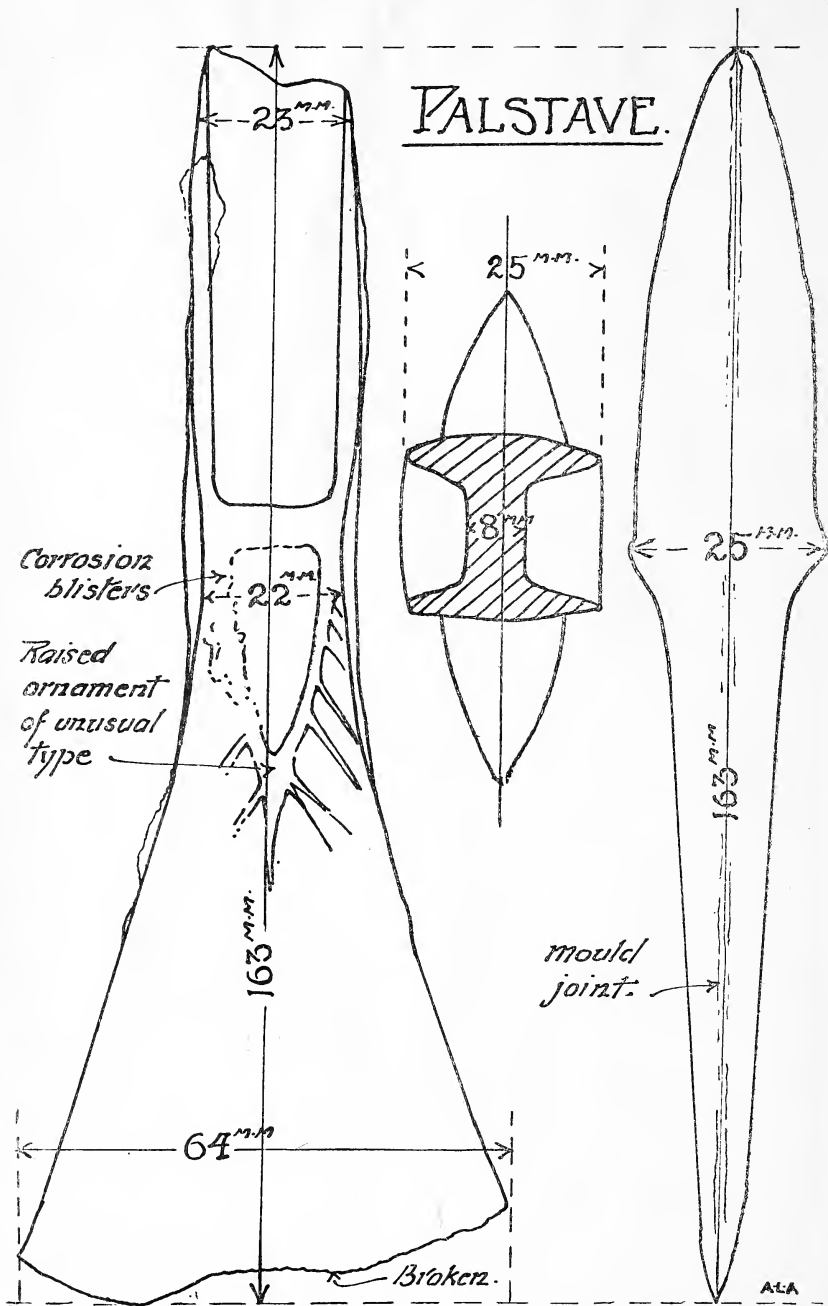
T. SHEPPARD, M.S.C., F.G.S.

So long ago as 1864 a small hoard of bronze axes was found at Windsor, in the Great Park. One of the specimens was presented to the British Museum, the remaining four to the Museum at the Albert Institute, Windsor, by the late Queen. The collections in the Windsor Museum were purchased



by the Hull Corporation recently, and the four Windsor bronzes were included. The British Museum example is briefly referred to in the *Proceedings of the Society of Antiquaries* for 1866 by the late H. W. Franks, in describing the additions to the British Museum during 1866:—‘A bronze celt of an unusual variety was presented by Her Majesty, having been found with others in the Great Park at Windsor.’ The other four are referred to in the *Handbook of the Museum of the Albert Institute, Windsor*, page 6:—‘In compartment 1, of Case A, there are two [four] British Bronze Celts, which were discovered in 1864, about 200 yards from Bishopsgate,

PALSTAVE.



Corrosion blisters

Raised ornament of unusual type

25 mm.

8 mm.

23 mm.

22 mm.

163 mm.

64 mm.

Brokers.

25 mm.

25 mm.

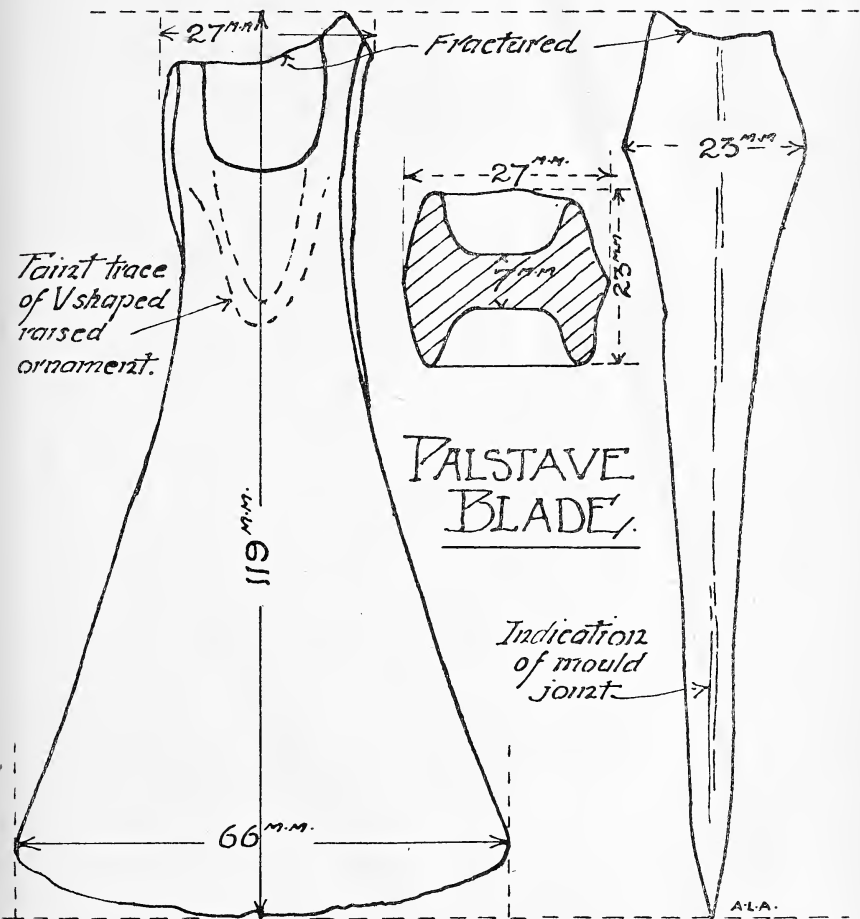
163 mm.

mould joint.

ALA

within the Park, Windsor Road. Others were found in the same place, but were lost by the workmen. Similar Celts have been met with at St. Leonard's, near Windsor, and at Farnham, Surrey.'

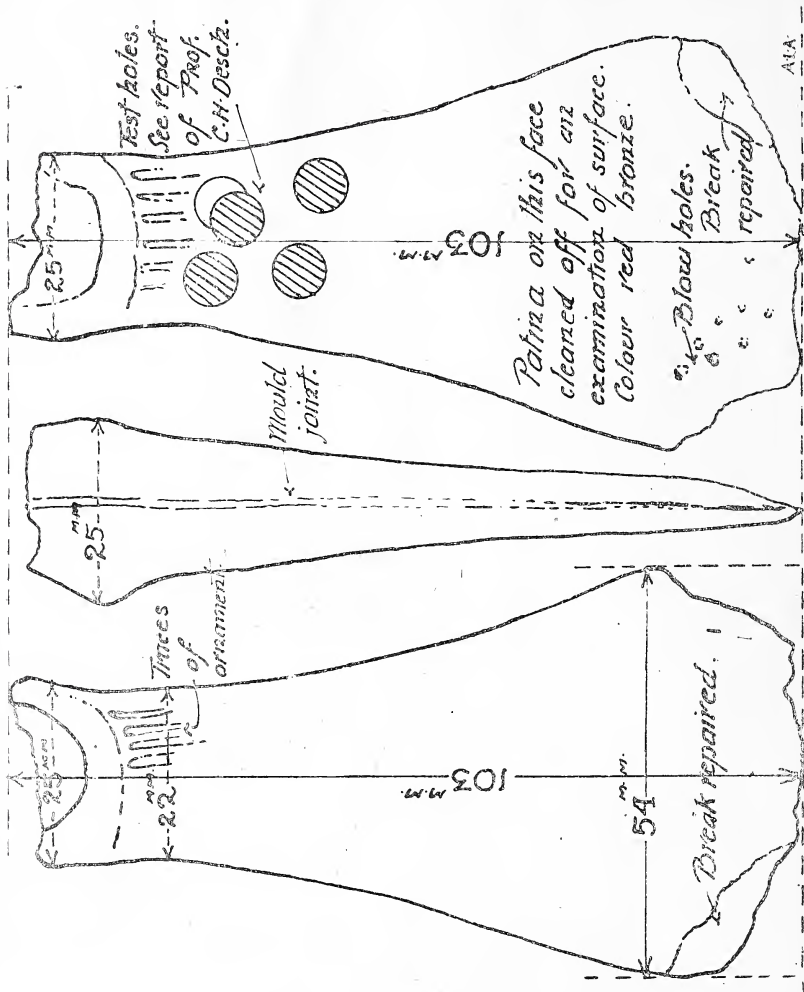
I have since had the opportunity of examining the axe



in the national collection, and there is no question that it is part of the same hoard.

While all are of a similar type, there are distinct differences in each example, clearly indicating that they were not cast in the same mould; in fact, the probability is that separate clay moulds were made for each, copied from one general

model.* The varying contraction of the clay in drying would account for the differences, particularly in the degree of ornamentation beneath the stop ridges.



There is a general 'un-English' appearance about these axes, suggesting their importation from the north of France, or having been copied from a French example. But the most remarkable feature in connection with them is their extraordinarily brittle nature, and the peculiar way in which

* See *Proc. Antiq. Soc.*, Vol. XVII., p. 132.

they have weathered, in fact they appear to be almost composed of a bronze 'slag.' The analysis given below seems to confirm this. The patina is not of the usual enamel-like description, and cannot be scraped off or removed artificially. By the aid of acid a portion of the patina was removed from one side of one of the smaller fragments, revealing a pitted and scoriaceous-like surface to the matrix. The removal of the patina, however, did not in any way assist in defining the rib-like markings below the stop ridges. The brittleness is most marked, pieces chipping off even with ordinary handling.

The probability is that owing to the mixture of impurities, the axes in this hoard were found to be unsuitable for ordinary purposes and were discarded. In almost all these particulars the Windsor hoard resembles a large hoard found more recently at Pear Tree, near Southampton, and described by Mr. W. Dale in the *Proceedings of the Society of Antiquaries*, 1898, pp. 129-131. Two of these are in the British Museum, the remainder, I believe, is at Winchester.

In view of the unusual character of the 'bronze' in these axes, I readily agreed to a suggestion that one should be analysed by Professor Cecil H. Desch, of the Sheffield University. He writes:—'My assistant has now completed the analysis of the bronze implements you sent. As the composition was a rather puzzling one, he repeated the analysis very carefully, and I now enclose his final result. The total still falls far short of 100, and this is evidently due to oxide. The casting really represents a failure, as the amount of oxygen and also of sulphur is so great that the metal is hopelessly brittle:—

ANALYSIS OF A PREHISTORIC BRONZE IMPLEMENT FROM THE HULL MUSEUM.

<i>Element.</i>				<i>Per cent.</i>
Copper	...	...	...	78·79
Tin	...	...	...	16·49
Nickel	...	...	...	0·49
Lead	...	...	...	0·09
Iron	...	...	...	trace
Zinc	...	...	...	nil
Sulphur	...	...	...	0·68
—				
Total	...	...	...	96·54
—				

The remainder consists apparently of oxide, for which there is no accurate method of analysis.'

In Evans's 'Ancient Bronze Implements of Great Britain' (page 421), analyses are given of a number of bronze axes,

among which is a 'socketed celt, Yorkshire.' This is as follows :—

				<i>Per cent.</i>
Copper	...	...	...	81·15
Tin	...	...	...	12·30
Lead	...	...	...	2·63
Iron	...	...	...	trace
Nickel	...	...	...	0·13
Silver	...	...	...	0·07
				<hr/>
Total	...	...	...	96·28
				<hr/>

To this particular specimen Sir John adds a footnote as under :—

' In this case oxygen to the extent of 3·83 was present. The bronze had become so friable as to be easily pulverised in a mortar. Mr. J. Arthur Phillips writes about it as follows: " When a freshly-broken fragment of it is examined under a low magnifying power, it is seen to consist of a metallic net-work enclosing distinct and perfectly formed crystals of cuprite, surrounded by a greyish white substance which is chiefly binocide of tin. In this alloy, the nickel, silver, and iron are evidently accidental impurities, but the lead is no doubt an intentional ingredient." The specific gravity after pulverization is about 7·26 only.'

It would seem, therefore, that occasionally impurities found their way into the bronze, with the results indicated.

Mr. A. Leslie Armstrong (who, together with Mr. G. A. Garfitt, has drawn the various Bronze Age objects in the Hull Museum for the British Association Committee on 'The Distribution of Bronze-Age Implements') has given such detailed descriptions of these implements, that, with his permission, I am reproducing his drawings with this paper. This is done in order to illustrate the excellent work of the Committee referred to, which has already dealt similarly with over 4,300 British bronze implements. These various drawings and descriptions are made in indelible black ink on cards and catalogued by this committee.

Mr. Armstrong has supplied copies of these drawings for the purpose of reproduction.

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Among the *Hull Museum Publications* recently issued are :—No. 126, Catalogue of Love Tokens and other Engraved Pieces in the Hull Museum ; No. 127, Yorkshire Tramway Tokens, and Yorkshire Seventeenth Century Tokens ; No. 128, Quarterly Record of additions, No. LXIII., containing various reprints from *The Naturalist*, and No. 129, Andrew Marvell Tercentenary Celebrations at Hull. All are illustrated.

EXTENDING RANGE OF THE FULMAR PETREL.

E. W. WADE, M.B.O.U.

THE report of the breeding of the Fulmar Petrel—*Fulmarus glacialis*—on the Bempton Cliffs is a matter for congratulation to the naturalists of Yorkshire, but there is nothing surprising in the event. In the seventeenth century the Fulmar was almost confined as a breeding species within the British Isles to St. Kilda, but as early as 1758 Macaulay reported the King's Sheriff in the Farnes as expressing his resentment at the Fulmar having established itself on the Holm of Myggenaes and on Sandö, where thirty years before it was unknown. The extension of the birds' breeding area, commenced in 1728, has gone on ever since. Fifteen years ago a friend told me it was breeding in the Orkneys, and during the last ten years, since attention was drawn to the subject, it has been reported as spreading down the east coast. In 1916 it commenced to nest in Aberdeenshire, in 1920 it was at St. Abb's Head, Berwickshire, and in 1919-1920 was reported at the Farnes, though its breeding was doubtful. In 1919 two birds in immature plumage appeared at the Bempton Cliffs. In 1920 there were at least seven, and more than this in 1921, when I saw a bird evidently changing from the immature to the mature plumage, and predicted that they would breed in 1922. Apart from the fact that the bird is new to us as a breeding species, it is very interesting, as evidence that the Fulmar does not breed till at least the third year of its age, no mature birds having been observed in previous years. The cause of the bird's gradual extension of its breeding range is obscure, though the process has been going on for a long period. A visit to St. Kilda in 1914, during which a great part of a fortnight was spent in studying the Fulmar, led me to the conclusion that there must be a yearly surplus of young birds which were squeezed out of the St. Kilda group, the ground being already fully occupied. The St. Kildans used formerly to take the Fulmar as food on all the islands, the young being taken from the nests in August and salted down for food for the winter. Many old birds also were snared on the nests. The young are taken on Hirta alone now, those on Soay, Bocreray and Stac an Arnim being generally left alone, as the introduction of more palatable food from Glasgow has led to the neglect of some of their former staple diet. There must thus be a large surplus population each year which cannot find breeding ground on St. Kilda.

To the St. Kildan the Fulmar is most valuable, as formerly it provided the only source from which they could get a supply of oil, and is still the main source of supply, in addition to

forming the staple food for the winter. I am told that the flesh of a young Fulmar tastes like chicken, but the St. Kildan palate has been educated for centuries, and it is open to doubt whether the average man would take to such fare very kindly. To us the bird is interesting as particularly strong and graceful on the wing, but otherwise of no special use. It is a voracious feeder, the St. Kildans saying that it was most partial to the flesh of a stranded whale, and many have been found dead in the herring nets off the Norfolk coast. Seton gives the derivation of the name variously as Fyl-mar (Norse) =the vomiting man, or Ful-mar=stinking maw, a name to which the peculiar odour of the oil which the bird ejects at intruders richly entitles it. In St. Kilda it occupies all the ground which the Herring Gull would possess were it established there, and has apparently driven out all other gulls, which are represented by an odd pair of Great Black Backed Lesser Black Backed and Herring Gulls here and there, except the Kittiwake, the breeding ground of which does not clash with its own. The St. Kildans destroy the eggs of the Herring Gull as our own cliff-climbers do, as they say it is a robber. The Fulmar prefers a grassy slope, and is not partial to the overhung rocky shelves frequented by the Kittiwake, though occasionally its egg may be found on the bare rock. In a dry situation it makes no nest, but if the ground be damp, a little dry grass is used. If the one egg is taken, no second is laid during the season. I found about 25 per cent of the eggs examined on the outlying stacs to be addled, as if the birds were getting old and past laying fertile eggs. The St. Kildans are very particular about leaving the egg undisturbed, though they snare one bird off the nest, as they say that the other parent will complete the incubation and rear the chick.



Part II. of *The Outline of Science* contains 'Psychic Science,' by Sir Oliver Lodge, and 'Wonders of Plant Life.' Both are well illustrated.

The honorary degree of D.Sc. has been conferred by the Leeds University upon Sir Richard Gregory, editor of *Nature*, and Sir Charles Sherrington, President of the Royal Society and President-Elect of the British Association.

Part 33 of Buckman's 'Type Ammonites' contains 16 plates, on one of which is figured *Ammonites gowerianus* Leckonby, from Scarborough, which is now described as '*Galilaeites indigestus* nov. Proplanulitan, *optimus*; Holotype.'

A third edition of 'A Guide to the Fossil Remains of Man in the Department of Geology and Palæontology in the British Museum (Natural History),' by A. Smith Woodward, has appeared. It contains a large number of valuable illustrations, and is sold at 6d.

Part IV. of H. Kirke Swann's new edition of *A Synopsis of the Accipitres* (diurnal Birds of Prey); *Microhierax* to *Pandion*, has been issued (Wheldon & Wesley, pp. 179-233, 6/-). It brings the work up to the end of 1920. We should like to commend this useful book of reference.

YORKSHIRE NATURALISTS AT CLITHEROE.

W. H. PEARSALL, D.SC. AND F. A. MASON, F.R.M.S.

THE 298th Meeting of the Union was held during Easter week-end, April 15th to 17th. The geological investigation of the Middle Carboniferous and its fauna, for which the excursions were primarily planned, and which was successfully accomplished, involved the examination of sections in an extended field overlapping the Yorkshire boundary to just within Lancashire. Clitheroe was selected for Headquarters, as it is conveniently situated for giving access to Pendle Hill on the East, and on the west to the valleys of the Ribble, and its tributary, the Hodder. Clitheroe is a small county town replete with mediæval tradition and associated with witches and witchcraft. The most important historical feature of Clitheroe is its castle, although little except the keep now remains to mark the site of one of the seats of the once powerful De Lacy's; the castle was dismantled by order of Parliament in the time of the Civil War. From the keep, perched on the top of a limestone knoll, a view is obtained that commands a wide expanse of Ribblesdale, and the Forest of Bowland, Pendle Hill, and the mountainous hills of North-west Yorkshire.

It was an unfortunate coincidence that another geological programme was being carried out, on the opposite side of the county, during the same week-end, and it undoubtedly militated against a large attendance at Clitheroe. On the day preceding the official date of the meeting, work was commenced by the Geological Section under the guidance of Messrs. John Holmes and Wm. S. Bisat on sections exposed in the valley of the Lower Hodder. From this time until the close of the meeting the geologists pursued a definite line of research, the results of which are embodied in a report received from Mr. Bisat.

Mr. Bisat says, 'The lowest beds examined during the week-end were those exposed in the Hodder under Hodder Place. Here a succession of alternating limestones and shales, estimated to be over 1000 feet in thickness, was seen dipping strongly upstream. These beds contain (sparingly) goniatites, trilobites and corals.

The party had the great advantage of being personally conducted over the site by Rev. G. Waddington (S.J.), of Stonyhurst College, who has studied and collected from these sections for many years, and drawn detailed charts of the exposures. Two goniatite zones were pointed out by him, and material was collected for future study. He considers these beds to form practically a complete exposure of the local Viséan, with possibly even lower beds present. The total absence of the characteristic Viséan brachiopod fauna is interesting.

A section, complementary to the above, was seen in the river Ribble at Dinckley Hall, again under the guidance of Mr. Waddington. These beds continue the section upwards, from the highest beds seen in the Hodder, into the 'Pendleside' zones.

Low down in the Dinckley section were seen bullions with beautifully preserved *crenistria*, and the succeeding beds of shale, with further bands of limestone bullions, yielded the typical "Pendleside" succession, including *Posidonomya becheri*, *P. membranacea*, *Goniatites spirale*, *Glyphioceras 'bilingue.'* In these beds careful search was made for *Glyphioceras reticulatum* and *Pterinopecten papyraceus*, but no trace was found either at Dinckley, Pendle Hill or Thornley Beck (near Chipping).

It is also to be observed that the so-called *bilingue* of these beds is not the *bilingue* of Salter, but another species of altogether earlier date, which closely resembles Salter's species in the spiral groove (in the cast) and lateral lappets, but differs considerably in the ornamentation of the test. This earlier species, up to about 5 mm. diameter, has distinct

ribs near the umbilicus, after which up to 15 mm. diameter the test ornament consists of thin distant riblets (about 1 mm. apart), extending rather wavily about half-way up the lateral area, where they die out, to reappear again, though less prominently, on the low spiral ridge at the latero-dorsal angle, where they bend sharply forward in a nose, and back again obscurely over the periphery. The species is evidently very close to *tornquisti* of Wolterstorff,* but the present species appears hardly to have such clear and regular striae as *tornquisti*, though this may be a matter of state of preservation.

It appears desirable to adopt a distinctive name for this lower form, and in future communications it will be referred to as *pseudo-bilingue*.

The species is common in the Bowland Shales at Pendle Hill, Dinckley Hall, Thornley Beck near Chipping, Lothersdale, and Eastby Beck, Embsay, but is better preserved at Pendle Hill than elsewhere.

The vertical thickness of rocks between *pseudo-bilingue* and *bilingue* is in Lancashire perhaps 3000 feet.

On this excursion the beds on Pendle Hill and at Thornley Beck, near Chipping, were also examined, and a closely similar lithological and palaeontological succession observed to that seen at Dinckley, though the lower (*crenistria*) beds were not well exposed. Both at Pendle Hill and at Thornley Beck thin sandstones (the Pendleside Grit) occur in or about the *spirale* zone.

It was observed that goniatites of the *crenistria* and *sphaericum* groups continue to occur above the typical *spirale* zone, nearly up to the first occurrence of *pseudo-bilingue*. At Eastby Beck, Embsay, the same ranging upwards of *crenistria* has also been observed, and it is probably general.

Considerable variation occurs in the sutures, thickness of whorl, and size of umbilicus of *Goniatites crenistria* as seen from different localities, and the variations may have time value.

A new marine horizon was found by Mr. Holmes on the west side of the valley of Ogden Clough, east of Little Mearly Clough, on Pendle Hill. Here are fugitive exposures of clay shale containing *Posidoniella*, and a coal smut.

Ganister and coarse grit blocks are frequent on the surface in the neighbourhood, and probably form the base of the marine band. One block of ganister contained brachiopods, and was probably of local origin.

The classic quarry of Black Hall, near Chipping, which furnished the material for many of Phillips' types, was examined. The quarry, which is in highly inclined beds of alternating limestone and shale, presumed to be equivalent to the upper part of the Pendleside Limestone, has been for many years disused, and the fossiliferous bullion bands, which apparently occurred in the shales capping the limestones, are not now visible.

A highly fossiliferous goniatite bullion was, however, found in the quarry wall, and the cottager kindly gave us a beautiful specimen of *implicatum* extracted from the spoil heaps.

The best thanks of the Geological Section are due to Rev. G. Waddington for his courtesy in placing his information on these beds at our disposal, for his active guidance in the field, and for his hospitality at Stonyhurst College, where the members of the party were shewn the extensive geological collections and given tea.

The members also had the stimulus and advantage of the presence in the field of Mr. W. B. Wright, Director of H.M. Geological Survey of Lancashire; Mr. J. Spencer, F.G.S., of Accrington; and friends from Blackburn and Accrington.

* Das Untercarbon von Magdeburg-Neustadt und seine Fauna Taf II., figs. 12, 13, 14—Jahrbuch d. Königl. Preuss. geolog. Landesanst. u. Bergakad., 1898.

Stonyhurst College, five miles from Whalley, in Lancashire, to which reference is made by Mr. Bisat, comprises a series of magnificent buildings, erected at different dates, commencing with an old Elizabethan mansion built in 1596. The latter afterwards became the first home of the English Jesuits, and to-day the College is the principal seat of Roman Catholic learning in this country. The Union is indebted to the Rector for his kindness in granting permission for members to inspect the contents of the College museum and library. The library contains a collection of more than 30,000 volumes, including many valuable illuminated and other manuscripts, early examples of the art of printing represented by Caxton's work, and other rare volumes of historical value. Among the contents of the museum may be mentioned, as a matter of special interest to Yorkshire Naturalists, Waterton's collection of birds. The scientific life of the College is evident in many ways; the buildings include an observatory equipped with magnetic and astronomical instruments, and the natural history of the district has been particularly well worked for many years by members of its teaching staff.

By Saturday, representatives of other Sections of the Union had arrived, including the President (Dr. T. W. Woodhead), most of whom joined the geologists in an excursion to Langho, for Dinckley Hall and Sale Wheel (in the Ribble). On the following day, while the geologists were investigating Pendle Hill, the zoologists and botanists visited Browsholme, *via* Bashall Caves, by the courteous permission of Col. John Parker, C.B., F.S.A. On this occasion the party, under the leadership of the President, was fortunate in having the services of Mr. Michael Demain, a local botanist with a good knowledge of the ornithology of the district. The thanks of all who joined that excursion are due to Mr. Wright (Col. Parker's Head Keeper) and to his wife, who, at remarkably short notice, provided a brew of tea when it was badly needed. The district is rich botanically, as well as in bird life, at the right time of the year; but the late cold season had visibly retarded the development of flowering plants, and migrants were late. In the President's report with regard to flowering plants, he says, 'This excursion was under the guidance of Mr. Demain. Most of the time was spent beyond the county boundary, but the day around Bashall provided a good opportunity of seeing the extensive pasturelands of this region. Here the solid geology is extensively masked by boulder clay, and this, together with the high rainfall, is reflected on the vegetation. Arable land is conspicuously absent, the rushy pastures suggest defective drainage, and the conspicuous tree is the Alder, which grows luxuriantly along road and field sides, and during our visit, bearing an unusual load of catkins. The heathy banks of the old lane leading to Bashall woods were richly clothed with old fronds of the Hard-fern, suggesting a wealth of growth rarely seen by our members. Bashall Woods are extensive coniferous plantations on an old heath ground flora. Here and there are occasional sphagnum bogs, the mosses entangled in a net of Cranberry. A pleasant surprise from the general wintry aspect of the vegetation awaited us on approaching the edge of a large cwm-like hollow on the stream bank, which was covered by an extensive carpet of Daffodil in full flower. On the hedge banks and lanes, a few orchids and the hairy violet were sending up their leaves. *Adoxa* was sparingly in bloom and the primrose opening its first flower.'

No observations of outstanding interest were made with regard to the cryptogamic flora of the district, although it was evident that the rocky bed of the Hodder would well repay examination for its mosses and hepatics.

Few fungi were seen. The trees, on the whole, presented a particularly healthy appearance, and parasitic polypores were rarely observed. The Ash is abundant, and occasional trees were found to be suffering from canker due to a Pyrenomycete, usually referred to *Nectria ditissima* Tul.,

the specific identity of which, however, has recently been disputed.* The only agaric worthy of mention is *Panus stypticus* Fr., which occurred on decaying stumps at Browsholme. No spring ascomycetes were found, and the uredines were not in evidence owing to the backward condition of their various host plants.

During the final excursion to Chipping, on Monday, members from Headquarters were joined by a party of members and associates from Hebden Bridge. These included Mr. Walter Greaves, who led the ornithological members. Short reports on the bird life of the district have been received from Messrs. W. G. Bramley, Dibb, and C. Hastings. As a result of their observations, it may be said that the Sandpiper had arrived by April 14th. On April 15th, Swallows and Martins were seen at Dinckley and at Clitheroe, but they were not again observed until April 18th, and it was evident that the birds seen on the earlier date were still in migration, and were resting on the journey north. Among other migrants noted were Sand Martin, Dipper, Ring Ousel, Yellow Wagtail, and Willow Warbler. Of the more interesting residents, Redshank, Tree Creeper, Marsh and Cole Tits, Curlew, Snipe and Stockdove were observed. Eggs of the very earliest nesting birds such as Blackbird, Robin and Hedge Sparrow only, were seen. The beautiful nest of the Longtailed Tit, ornamented on the outside with fragments of the lichen, *Parmelia saxatilis*, was found completed, but the bird was not observed. The Woodcock breeds regularly in the district, and Mr. Wright, the Keeper at Browsholme, was able to show photographs of this species, and also the of Merlin, on their nests.

A General Meeting was held at Headquarters on Monday, April 17th, under the chairmanship of the President, when cordial votes of thanks were accorded to landowners who had so kindly thrown open their estates to members of the Union, to the Rev. G. Waddington and Mr. M. Demain, whose local knowledge had greatly facilitated the work of the week-end, and to Mr. John Holmes for the satisfactory arrangements that had been made for the meeting. Sectional Reports were rendered by various members whose names already appear in the present report. Mr. Holmes gave an account of the work of the late past-President of the Union, Dr. Wheelton Hind, tracing its influence on our present knowledge of the fauna of the Carboniferous Limestone, and explaining the bearing of the present investigations on that work. Eleven new members were elected.

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A new edition of **Handbook No. 1 of the Tolston Memorial Museum Publications (Huddersfield)**, edited by **Dr. T. W. Woodhead**, has been received, and it contains a 'History of Ravensknowle,' by Legh Tolson; and 'Scheme for the Development of a Local Museum,' by the Editor. (24 pp., 1/-). There is a view of the building, plans of the rooms, etc., and the pamphlet explains the scope of the collection.

Catalogue of the Fossil Bryozoa (Polyzoa) in the Department of Geology, British Museum (Natural History). The Cretaceous Bryozoa (Polyzoa), Vol. IV.; The Cribrimorphs, Part II. By **W. D. Lang**. London: British Museum, 12+404 pp., 32/6 net. This well-printed volume by Dr. Lang is a continuation of that reviewed in these pages (August, 1921, p. 272), and it completes a catalogue of the Cretaceous Cribrimorph Cheilostomata in our National Collection. There are eight plates from drawings by Miss Woodward, which are remarkably clear. As in the previous instance, most of the species figured and described are from Sussex and the south, though the eastern counties have provided some.

* Cayley, Dorothy M., 'Some Observations on the Life-History of *Nectria galligena* Bres.', Ann. Bot. 35, 1921, p. 80.

YORKSHIRE NATURALISTS AT BINGLEY.

W. H. PEARSALL D.S.C., AND F. A. MASON, F.R.M.S.

THE meeting of the Yorkshire Naturalists' Union on the 13th May had for its object the examination of the Harden Valley, near Bingley. Owing to the unusual lateness of the season, the results of the investigation were in many respects disappointing, but an unusually large gathering of members and associates had otherwise an enjoyable and varied day.

The route traversed followed the river as far as Beckfoot, and thence went up the Harden Beck towards Goitstock, returning to Bingley by way of Harden Moor, Heather Glen and the Druids' Altar. Much of this area lies in the Manor of Harden, in earlier days belonging to the Cistercian Abbots of Rievaulx. It is rich in historical and artistic associations, which one would perhaps not suspect from its present industrial surroundings, and many members made use of the opportunities offered to commence their acquaintance with the numerous features of archaeological interest. At Beckfoot, the farm buildings show double crosses and stone lanterns, which indicate that they had belonged to Crusaders when built about 1617. The pack horse bridge, dating from 1723, lies on an old pack route between Scotland and the south, which had probably been in use for centuries before the bridge was rebuilt. Bingley itself was a Saxon township, and the present cemetery on Bailey Hills occupies the site of a prehistoric settlement formerly bounded by the river, and an extensive lake and marshes, which were, even in 1846, almost impassable, and, later, nearly led to the abandoning of the present railway line. On Harden Moor there are ancient barrows, earthworks, and a Roman road.

Rossetti stayed at Harden Grange for a time, and the summer house at Wood Bank contains paintings by one of his pupils. The Druids' Altar figures in Disraeli's novel 'Sybil.'

GEOLOGY (E. E. Gregory):—The uppermost rock of the district visited is the Rough Rock, while the portion traversed by the Harden Beck presents a series of grits, sandstones, and shales immediately underlying the Rough Rock. A 'fault' runs approximately in an east to west direction along the Harden Valley, and extends from beyond Bingley to the west of Harden village, where it terminates against another 'fault' crossing at right angles, which can be traced from Keighley—south by east—to Bradford. This latter fault has contributed to the formation of Deep Cliff, or what is known as Heather Glen, up which the party proceeded from Harden village. On the western slope of the glen, and near the head of the valley, striking evidence of the fault was seen in the 'slickensided' face of the crags.

On the eastern side of Heather Glen, on what is known as the Lower Crag, several examples of glaciated rock surfaces were observed on the exposed portions of the Rough Rock, particulars of which have been published in the *Proceedings of the Yorkshire Geological Society* for 1906.

Numerous indications of Glacial times were in evidence. Bingley itself stands upon a moraine, and boulder clay and gravels occur at Beckfoot and along the Harden valley. Airedale, in this neighbourhood, has been filled up considerably with glacial debris, such as 'Till' or boulder clay, which contains large boulders of Carboniferous Limestone and grits, and other Carboniferous rocks; also a few Silurian grit boulders, mostly of small size. In addition, sands and gravels are well represented, and a number of morainic mounds extend both above and below Bingley. Formerly, particularly in the 17th century, the morainic mounds at Castlefields, Bailey Hills, Myrtle Park, Hesp Hills, and other places, were excavated for the limestone boulders which they contained, which were burned in rough kilns on the spot.

The pre-glacial river level would be considerably below the position

which it now occupies, as shown from the results of borings for wells and other works. Commencing at Cottingley Bridge, and proceeding up Aire-dale to Keighley, these may be summarised as follows:—

(1) The Bradford waterworks pipe track is carried over the river Aire just below Cottingley Bridge, and here 66-ft. piles were driven down, but the solid rock was not reached.

(2) At Britannia Mills, Bingley—800 yards from present course of river—a boring reached the rock at 90 ft.

(3) The Vicarage near Bingley Church is built on a bog, and in order to secure a proper foundation, 20 ft. of peat were cut through, but as no solid ground was found, elm piles 20 ft. long were driven down without reaching the floor of the bog; the surrounding strata being glacial clay and morainic debris.

(4) In doubling the Midland Railway track at Marley—where it crosses the river Aire—circular steel cylinders of large diameter were sunk to a great depth in the river bed in order to carry the bridge. A good foundation was reached at about 85 feet from the level of the rails, but this was not the solid rock on the floor of the valley.

(5) At Keighley the boring at Fleece Mills through glacial material to the solid rock is 80 ft.

(6) That at Hanover Mill is 77 ft.

(7) That at Crown Works is 120 ft.

(8 and 9) Two sunk in Goulbourne Street are 67 ft. and 80 ft. respectively.

As Keighley is situated at the mouth of the Worth Valley, and rather more than a mile from the present course of the Aire, the borings enumerated are important. It would appear conclusively that the level of the pre-glacial valley was considerably more than 100 feet below the present one.

VERTEBRATE ZOOLOGY.—Mr. W. H. Parkyn writes:—This meeting reminded me more forcibly than ever of Jefferies' 'I do not want change, I want the same old loved things—the same wild flowers, the same trees and soft ash green, the blackbird, the coloured yellow-hammer, sing, sing, singing as long as there is light to cast a shadow on the dial—let me watch the same succession year by year.'

This was the spirit that moved so many of us to meet on this occasion.

With all these keen field men, very little, if any, living creature escaped observation. One of the most pleasing features was the occurrence of six or seven pairs of the most graceful of the Wagtails, the Grey. One had fallen a victim to some bird of prey: the feathers were examined. The lovely yellow of some of the feathers showed how closely this bird connects the Pied and Yellows. Sandpipers were flushed from the same sandy bed where they were expected. Tree Creepers were noted, and these had successfully hatched off, and young were being fed continuously. Woodpeckers occur, and a newly drilled hole was noted. Kingfishers; Willow Warblers in every few trees; Wood Warblers; Flycatcher, spotted only, although to the mere man, we wonder why the Pied will not stay in the Aire Valley, although a few miles away, in Wharfedale, it never misses breeding. A Raven, passing over, was quickly identified by two separate parties. Redstarts, among our prettiest birds, were in evidence, and Whitethroat, although only here a day or two, had a completed nest. Dippers still nest on the banks of the stream. The Garden Warbler was seen and heard. The Mistle Thrush was in evidence in goodly numbers; a pleasing feature after the thinning out of the severe winters of a few years ago; these are now quite normal in numbers in the district.

Wood Pigeons and an odd pair of Stock Doves still struggle on in this frequented place. Owls, too, are seen and heard frequently.

A little party of five or six Twites was seen, and a newly arrived party of ten to twelve Cuckoos spread itself in very conspicuous

fashion, the colouring showing up very blue among the dull dark heather.

MOLLUSCA (F. Booth) :—Perhaps the most interesting find was that of *Paludestrina jenkinsi* in a small tributary of Harden Beck and also in a pond at Wood Bank, by Mr. Greevz Fysher. This species is rapidly extending its range in Great Britain, but as yet its mode of distribution remains unknown. *Limnaea pereger* occurred in the Beckfoot millpond, and the boggy ground at Marley yielded *L. truncatula*, *Hyalinia alliaria*, *H. radiatula*, *Limax laevis* and *Arion minimus*.

ARACHNIDA (W. Falconer) :—The two arachnologists present at the meeting, starting much earlier than the main body, traversed the whole route planned out in the circular, and sampled the most promising localities on the way. Spiders were by no means plentiful, and many were immature. Two species, not of common occurrence, but sometimes abundant where found, *Theonoe minutissima* Camb. 1 ♀, and *Centromerus arcanus* Camb., several of the same sex, the male of which is one of the few among its order larger than its mate; both at Goitstock. The rest, more generally diffused in suitable situations, are only of interest as definite records for the district. Three kinds of wolf spiders were seen among the grass in various places, *Lycosa pullata* Clerck., the most abundant, *L. amentata* Clerck., and *L. palustris* Linn., the last by the dam at Beckfoot. Not a single harvestman was met with; but the false scorpion, *Obisium muscorum* Leach, was noted throughout the route. Mites were not specially looked for, and only a few common kinds were taken at Goitstock and St. Ives, viz., *Ritteria memorum* Koch., *Gamasus crassipes* Linn., *G. cornutus*; at Goitstock and Heather Glen, *Linopodes motatorius* Linn.; at Goitstock, *Oppia bipilis* Herm. and *Damaeus clavipes* Herm. The most interesting species was the one attached to the underside of a burying beetle. It was not submitted for examination and the name cannot be given, as there are more than one species with this habit. They are not parasitic in this position, that is, feeding at the expense and to the detriment of their host, in that case they would remain fixed in one position, pierce through the chitinous armour of the insect, and suck its juices, and not merely hold on, as they do, by its hairs. In this way they secure dissemination, but the companionship has now come to be regarded as mutually helpful, the mites at times scattering over the beetle's body, and eating up the unsavoury particles with which, from its habit, it becomes soiled, thus keeping it clean. List of spiders not previously named (Localities—1=St. Ives Wood; 2=Heather Glen; 3=Goitstock) :—

<i>Clubiona terrestris</i> Westr., both sexes, 1.	<i>Amaurobius fenestralis</i> Stroem., 3.
<i>Cryphoeca silvicola</i> C.L.K., 3.	<i>Coelotes atropos</i> Walck., 1.
<i>Pholcomma gibbum</i> Westr., 3.	<i>Robertus lividus</i> Bl., 3.
<i>Linyphia clathrata</i> Sund., ♀, 3.	<i>Linyphia peltata</i> Wid., 1, 2, 3.
<i>Leptyphantes zimmermannii</i> Bertk., 3.	<i>Labulla thoracica</i> Wid., 3.
<i>Porrhomma montanum</i> Jacks., ♀, 3.	<i>Poecilometes globosa</i> Wid., 1, 2, 3.
<i>Rhabdoria diluta</i> Cb., ♀, 3.	<i>Macrargus rufus</i> Wid., ♀, 1.
<i>Erigone dentipalpis</i> Wid., ♂, 1.	<i>Maso sundevallii</i> Westr., ♀, 3.
<i>Cornicularia cuspidata</i> Bl., 2.	<i>Diplocephalus fuscipes</i> Bl., 1.
<i>Epeira diademata</i> Clerck., 2.	<i>Nesticus cellulanus</i> Clerck., 3.
<i>Meta merianae</i> Scop., 2, 3.	<i>Meta segmentata</i> Clerck., 2.
	<i>Neon reticulatus</i> Bl., 3.

DIPTERA (Chris. A. Cheetham) :—Diptera were represented by few species, and only the dung fly, *Scatophaga stercoraria* L., occurred in any quantity. Two species of *Bibios* (*B. johannis* L. and *B. laniger* Mg.) were taken, and others included *Platychirus albianus* F., *Borborus equinus* Fln., *Sepsis cynipsea* L., with undetermined species of Chironomidae, Psychodidae and Phoridae. Two species of Chloropidae,

one of which will probably be an addition to the Yorkshire list, but requires confirmation; the other, *Elachyptera cornuta* Fln., has only been recorded twice in the county, though considered a common species. At the top of Heather Glen, by the moor edge, *Tipula plumbæa* F. was seen in fair quantity.

BOTANY (W. H. Pearsall):—Peat covers the flat-topped hills in most places, but although several exposures were examined, no significant remains were observed. The peat is much eroded and somewhat irregular—and it is largely covered by heather moor. No *Eriophorum* peat was seen. The steeper valley slopes are clothed with dry oak woods of the types recognised by Dr. Woodhead in the Huddersfield district. These are usually much planted, but in Heather Glen there is an interesting fragment of vestigial Oak-wood with a Bilberry-heath ground flora. These types of vegetation are never floristically rich, and consequently few of the rarer flowering plants were seen. Mr. J. Beanland pointed out the fact that the naturalised *Claytonia sibirica* had spread within recent years, right down the Harden Beck almost to its outlet into the river. Only the commoner mosses and liverworts were observed, and all these have been previously recorded for the area. The somewhat unexpected presence of *Hypnum commutatum* associated with water moderately rich in lime could probably be attributed to the presence of limestone boulders in the drift.

MYCOLOGY (F. A. Mason):—Several members interested themselves in the collection of fungi, and the following notes are the results of their combined observations. Among the polypores, *Daedalea quercina* occurred near Beckfoot; *Polyporus squamosus* and *P. betulinus* were frequent in the Harden Valley. Agarics were scarce, and the only representatives were *Psilocybe foenicesii*, *Psathyra gracilis*, *Panaeolus sphinctrinus*, *Coprinus comatus* and *Stropharia semiglobata*. None of the three Ascomycetes mentioned by Mr. Hebden in the Circular was observed, although several interesting species belonging to this group were collected, among them the Morel, *Morchella esculenta*, and *Sclerotinia Curreyi*. The latter is a stipitate discomycete found growing on decaying *Juncus* stems. In autumn the presence of the sclerotium of this fungus in a rush may frequently be detected by drawing the stem through the finger and thumb with gentle pressure; this sclerotium remains embedded in the rush during the winter, and in the following spring gives rise to the cup-like fungus as seen at Bingley.

The common Uredines, *Puccinia Hypochoeridis*, *P. variabilis*, *P. Violæ*, *P. Poarum*, *Uromyces Ficariae* and *U. Poae* were distributed over the whole area. A pile of dry logs by Harden Beck furnished the Hyphomycetes, *Trichothecium roseum* and *Botrytis cinerea*, as well as the mycetozoan, *Reticularia Lycoperdon*.

PLANT GALLS (W. Falconer):—Owing to the backwardness of the vegetation and the absence of foliage, there was practically nothing to be found in the way of plant galls, although in a normal season there should have been a considerable number in evidence at this time of the year. The only new one was *Eriophyes avellanae* Nal. (the big mite bud of the hazel), between Marley and Bingley. Two oak Cynipid galls were observed; a swollen 'spangle,' *Neuroterus lenticularis* Oliv. which continues its development, although detached from the tree, in natural surroundings, at Goitstock, and an old *Andricus corticis* Linn. at St. Ives Wood.

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R. W. Anderson writes on 'Distinctive Features of Cleveland Ironstone Mining' in *The Quarry* for June.

H. W. Stunkard describes some new Blood Flukes in *American Museum Novitates*. At first we thought it was a treatise on billiards!

THE SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.
Slaithwaite, Huddersfield.

(Continued from page 174).

Lycosa palustris Linn.

Widely distributed in the British Isles and on the Continent, North Europe, south to Pyrenees and Hungary and extending eastward to Turkestan and the Amur; usually common. *Adult*, May to July, ♀s later also. First occurrence—the author, Slaithwaite, July, 1907.

V.C. 61.—Sutton Drain and Kelsey Hill, E.A.P.; Deepdale Woods (Beverley), H.C.D.; Newbald, Weedley Springs, Houghton Woods (Market Weighton), Cans Dale, Birkhill Wood, T.S.

V.C. 62.—Ayton, 1 ex., J.W.H.; Ravenscar; Upleatham.

V.C. 63.—Bottoms Wood, Wilberlee and Ainley Place (Slaithwaite); Dean Head; above Drop Clough; Wessenden Valley; Gunthwaite; New Mill.

V.C. 64.—Howden Ghyll, Oxenber, Cocket Moss, Horton in Ribblesdale, Giggleswick Scar, W.P.W.; Y.N.U., Malham, Goredale; Arncliffe; Grass Woods; E. Keswick; Ingleton.

V.C. 65.—Cautley, W.P.W.; Y.N.U., Upper Teesdale, Mickleton; Semmerdale.

L. monticola C. L. Koch.

Noted for many widely separated places in Great Britain as far north as Aberdeen and Ireland. Continental range extensive, Norway to South France and Italy; found on the sea coast or on more elevated inland stations. *Adult*, May to July, ♀s also later. First record—C. Mosley, Huddersfield, V.C.H.

V.C. 63.—Lidgett Green, T.St.; near Huddersfield, C.M., named by the Rev. O. P. Cambridge.

V.C. 64.—Malham, T.St.; Ledstone, F.B.

V.C. 65.—How Gill, 1 ♀, W.P.W.

Fam. SALTICIDAE, 12-34.

Gen. *Heliophanus* C. L. Koch, 2-3.

H. cupreus Walck.

Widely distributed in the British Isles, as far north as Aberdeen; abroad, Norway, France, Spain, Italy, Hungary and South Russia. *Adult*, May to July. First occurrence—the author, Stubbing Moor, June, 1905.

V.C. 61.—Brantingham Dale, T.S.

V.C. 62.—Levisham, 1 ♀, near the station.

V.C. 63.—Barnsley, W. Barraclough, 1 ♀.

V.C. 64.—Stubbing Moor, 1 ♀.

H. flavipes C. L. Koch.

Occurring throughout England and Wales, but commoner in the south than in the north; not common in Ireland, and only recently noted for Scotland. Continental range extensive, Scandinavia, France, Germany, Austria, North Italy, South Russia. *Adult*, June to August.

V.C. 61.—Spurn, 1 ♂, 2 ♀, T.S., May, 1908.

Gen. *Euophrys* C. L. Koch. 3-5

E. frontalis Walck.

Widely distributed in the British Isles as far north as Aberdeen and in N. and W. Ireland; abroad, Sweden, France, Italy and

Central Europe; usually common. *Adult*, spring and summer. First record—woods, Yorkshire, S.G.B.I., sub *Salticus frontalis* Walck; R. H. Meade, Bradford (V.C. H.).

V.C. 61.—Spurn, both sexes, E.A.P., T.S.; Kelsey Hill, E.A.P.; Bridlington, Humber shore at Welwick, both sexes, Weedley, Brantingham Dale, Sunk Island, T.S.

V.C. 62.—Scalby Mills, adults both sexes; Levisham, 1 ♀.

V.C. 63.—Bradford, R.H.M.

V.C. 64.—Linton Common, both sexes.

E. erraticus Walck.

In this country chiefly of north and west range, Devon and Glamorgan being the only southern localities for it; very rare in Ireland (Connaught), but with a very extensive range on the Continent, South Russia and Mediterranean to Norway. *Adult*, May and June. First occurrence—the author, Slaithwaite, July, 1900.

V.C. 63.—Earby, F.B.; Varley Road, Slaithwaite, two males from top of an earth-covered wall.

E. aequipes Camb.

A very rare and local spider, on record for Dorset, Glamorgan, near Brighton, Barton Moss (Lancs.), Richmond Park (Surrey), Staffs., Oxford and Glasgow. *Adult*, May and June.

V.C. 61.—Spurn, an adult pair, May, 1909, T.S.

Gen. *Neon* Sim., 1-2.

N. reticulatus Bl.

Widely distributed in the British Isles as far north as Moray, but commoner in the north than in the south, scarce in E. S. and W. Ireland; abroad, Norway, France, Germany, Austria, Hungary; amongst grass, heather, fallen leaves and moss, and under stones. *Adult*, ♂ May to August. ♀s most months of the year. First record—O. P. Cambridge, Bradford, *Zoologist*, 1860, p. 6862-63.

V.C. 62.—Basedale, Farndale, Gt. Ayton and Eston Moors, Turkey Nab, common, J.W.H.; Ringingkeld Bog; Hayburn Wyke, Kilton Woods.

V.C. 63.—Bradford, O.P.C., May, 1859; Bradford, G.H.O. (V.C.H.), Hurst Wood (Shipley), Blackhills (Bingley), Harden, Cottingley Wood, W.P.W.; Bingley Woods, R.B., W.P.W.; Y.N.U., Deffer Wood; Coxley Valley; Hebden Bridge (one gynandrous example included), Hardcastle Crags, and Crimsworth Dene; woods and cloughs about Huddersfield, Slaithwaite, Marsden, Greenfield, Meltham, Honley, Stocksmoor, Holmfirth, Armitage Bridge, Almondbury, Farnley, Lepton, Mirfield, etc. In many of these localities, common.

V.C. 64.—Rivock, Howden Ghyll, Harewood Park, W.P.W., Sawley district, S.M., W.F.; Adel Moor and King Wood; Bolton Woods; Malham Cove; Ingleton.

Gen *Sitticus* Sim., 1-4.

[Gen. *Attus* Walck, ad part.]

S. pubescens Fabr.

Widely distributed in the South of England and in the Midlands and some places abundant, less common in the north, and scarce in Ireland. Continental range very extensive, all Europe; on walls of gardens, greenhouses, and on tree trunks.

Adult, May and June. First record—supposed to be the spider meant in Dr. Lister's *De Araneis*, p. 90, 1678.

V.C. 61.—Hull, in a garden, 1 ♂, and Museum, 1 ♂, T.S.; Hull, 1 ♂, W. C. Eagland.

V.C. 63.—Bradford, G. H. O. (V.C.H.); Willsden, 1 ♂, R.B.; Bingley Seven Arches, and Salt Schools, Saltaire, ♂, W.P.W.

V.C. 64.—East Keswick, 1 ♂, on garden wall of Argyle House, June, 1903.

Gen. *Salticus* Latr., 2-3.
[Gen. *Epiblemum* Hentz.]

S. scenicus Clerck.

Widely distributed in the British Isles and on the Continent; Greenland, and North Norway to South Spain and Italy; occurs also in North America; usually found on walls and buildings but occasionally on trees, fences and gateposts. *Adult*, June and July. First record—W. Denison Roebuck, *The Naturalist*, December, 1881, p. 83.

V.C. 61.—Hessle Cliffs and Holderness Road (Hull), H.C.D.; Leconfield H.M.F.; Hornsea Mere, Market Weighton, Snake Hall, (North Cave), Welwick, T.S.; Hull, H. Donaldson; Bubwith, J.F.; Rillington, abundant.

V.C. 62.—Eston, Ayton, Gunnergate, Middlesbrough Park, common, J.W.H.; Scarborough, H.C.D., R.A.T.

V.C. 63.—Bradford, Mr. Reddy; Cawthorn, on walls of Museum.

V.C. 64.—Leeds, at Sunny Bank, Hyde Park and Kirkstall, and Pannal, W.D.R.; Ilkley, W.R.B.; Baildon Bridge, J.T. Beck; Shipley Glen, J. B.; Saltaire Park, W.P.W.; Meanwood Side, Leeds, per Mr. Roebuck.

S. cingulatus Panz.

Widely distributed in Gt. Britain, north to the Grampians, and on the Continent, France to S. Russia; more recently found in Ireland; usually beneath the bark of trees and fences, on tree trunks, gates, etc. *Adult*, June and July. First occurrence—the author, E. Keswick, June, 1903.

V.C. 61.—Hornsea, Ryehill, Risby, Houghton Woods, T.S.; Bubwith, J.F.

V.C. 62.—Lonsdale, under bark on fences and on ash trees; Ayton, Kildale, Nunthorpe, Eston Moor, abundant in first-named locality, J.W.H.; Seamer Lane, Scarborough, R.A.T.; Lazenby, 2 ♀s; Rillington, many from fences.

V.C. 63.—Campsall, near Askern.

V.C. 64.—E. Keswick; Bishop Wood (Selby).

Gen. *Hyctia*, Sim., 1-1.

H. nivoyi Luc.

Rare, sometimes locally abundant, noted for localities on the south coast of Britain, Kent, Sussex, Dorset, Devon, Glamorgan and Co. Waterford, 1 ♂; abroad, France, Austria and Russia. Inland it has been met with in Dorset, Wicken Fen, and Northants. *Adult*, May to August. First occurrence—T. Stainforth, Spurn, May, 1908.

V.C. 61.—Spurn, both sexes, roots of grass on sandhills, T.S., E.A.P.; sand dune between Patrington and Kilnsea, 1 ♀, T.S.; all over the headland, May, 1913.

Gen. *Evarcha* Sim., 1-1.

[Gen. *Hasarius* Sim, ad part.]

E. falcata Bl.

Widely distributed in the British Isles as far north as the Grampians and in S. and W. and E. Ireland, and abroad, all Europe and Asia to Sumatra; usually beaten from heather or lower branches of bushes, but some of following from grass. *Adult*, May to August. First record—Supposed to be this spider, *De Araneis*, p. 91, 1678, Dr. Lister.

- V.C. 61.—Market Weighton, on road to Holme-on-Spalding Moor' Houghton Woods (common), T.S.
 V.C. 62.—Kilton Woods, 1 ♂.
 V.C. 63.—Wilsden, 1 ♀, R.B.; Martin Beck Wood, C.; Deffer Wood, imm.; Butternab Wood (Huddersfield), few; Drop Clough, few; Storthes Hall Wood, 2 ♂s; Spring Wood, Netherton.
 V.C. 64.—Grass Woods, Grassington, 1 ♀, W.P.W.

Gen. *Hasarius* Sim., 1-3.

H. adansonii Sav.

In the British Isles an introduction from the Mediterranean, but establishing itself in hothouses; occurs also in parts of Africa and Asia.

- V.C. 61.—Pearson's Park, Hull, 1 ♂, 1 imm. ♂ and ♀, H. Knight, December, 1908.

NOTE.

In Dr. Martin Lister's tract 'De Araneis,' 1678, the notes on Yorkshire spiders occur on the following pages, 29, 33, 37, 43, 47, 51, 54, 61, 65, 67, 75, 81, 82, 90, 91, 99, 100, but whether the spiders *Agelena labyrinthica*, *Tetrrix lycosina*, *Dolomedes mirabilis* (*Pisaura*) *Salticus sparsus* (*Sitticus pubescens*), *S. coronatus* (*Evarcha falcata*) are the same as those at present bearing these names cannot be guaranteed.

If the first named be correctly identified with the present species it is an addition to the county list, but there is no other mention of it as a Yorkshire species elsewhere—locality, 'circa Eboracum.'—'alibi eos multoties vidi.'

—: o :—

Wild Life in the Tree Tops, by Capt. C. W. R. Knight. London: Thornton Butterworth, Ltd., 144 pp., 21/- net. This volume appeals to us more from the collection therein of photographs (there are over fifty), which it is stated were taken literally in the tree tops. The author has specialised among the Buzzards, Hawks, Owls, but has notes on the Heron, Crow, Rook, and occasionally refers to Bats, etc. Most of the photographs are really very well done.

Our Resident Birds and How to Know Them; Our Migrant Birds and How to Know Them. Each of these volumes is by E. F. M. Elms, is published by Thornton Butterworth, has twenty-nine illustrations from photographs from nature, and is sold at 6/-. The descriptions are made as concisely as possible under the heads, 'Haunts, Observation, Plumage, Language, Habits, Food and Nidification.' There are chapters on How to use the book, and some statistical information.

In Nature's Ways, by Marcus Woodward. London: C. A. Pearson, Ltd., 222 pages. This little volume is for children, and has a Foreword by Mr. W. Mark Webb. It deals with various common species of birds, reptiles, mammals, insects, etc. Interesting as the chapters may be, however, and the author is evidently a keen disciple of Gilbert White, to us the attraction is in the collection of very clever sketches by J. A. Shepherd, who hits off the characters of the animals admirably.

Junior Botany, by T. W. Woodhead. Oxford: Clarendon Press, 210 pp., 3/6. This is an abridged edition of the author's work, 'The Study of Plants.' It ought to be a welcome book in schools where the present price of the larger book is nearly prohibitive. The subject matter is quite as advanced and as thoroughly well treated within the limits chosen as in the first book, so that it will fulfil the needs of the students in middle and upper classes of Secondary Schools. There is little new matter and little change in the mode of presentation.

ROMANCE OF THE CUCKOO.

E. P. BUTTERFIELD.

SINCE writing the notes on the Cuckoo (*The Naturalist*, March and April, 1918), this bird has received a fair share of attention from ornithologists.

In studying the habits of the Cuckoo, it should be remembered that no two individuals are in all their habits alike, and it is to be feared that many writers fall into the error of assuming that because one or two Cuckoos possess certain habits, these apply to Cuckoos in general.

There are yet many problems in the economy of the Cuckoo which remain to be solved. One is, whether the cry 'Cuckoo' is common to both sexes? Many, perhaps nearly all, naturalists have held, and still hold, the belief that the well-known call is confined to the male, but for many years I have had a belief, on good evidence, that at least occasionally the female does utter the call notes. In *The Daily Mail* for the 1st April I saw a letter by Major Clarke, Malmsbury, in which he states: 'Some fifty years ago my grandfather shot a Cuckoo which was flying overhead and crying "Cuckoo" as it flew. I picked up the bird, nearly dead—it died in my hand, and as it was dying it laid an egg in my hand,' and I have recorded a very similar occurrence for this neighbourhood.

Mr. J. Whitaker, in *The Countryside* for 1914, page 422, states: 'I am sure both sexes call 'Cuckoo.' I have a record by a lady who mentions a Cuckoo having been shot in the act of singing, and on dissection it proved to be a female.

I could give many instances in which naturalists state that they have heard Cuckoos cry 'Cuckoo,' and immediately after utter the bubbling notes, so characteristic of the female bird.

The March Cuckoo is almost universally termed a 'March myth,' at least by British naturalists. The late Lord Lilford, in *The Zoologist* for 1894, wrote: 'I have not as yet even seen a Cuckoo that was even supposed to have been obtained in this country before April; till I have seen a specimen positively sworn to by a competent person as so obtained, I shall remain as at present incredulous.'

In *The Field* for April 20th, 1907, Mr. F. W. Frohawk gave a record of a Cuckoo near Hereford on 29th March, 1907, which seems to be reliable. In *The Yorkshire Weekly Post* for February 25th, 1911, there is a record of a Cuckoo having been found dead in Oxfordshire on the 1st April, and presumably alive on the 31st March; and in *The Countryside* for 1914 (page 614), Mr. Arthur Goodier writes: 'I have myself seen a Cuckoo on the last day of March this year (1914), and in order to prove this I went in the proximity of the sound, and on nearing the spot, the Cuckoo flew from an elm tree. In the *Birds of Scilly*, which is a few miles outside of Britain, Dorrien-Smith, a reliable authority, saw the Cuckoo on St. Mary's on the 29th March, 1904, and two other persons saw it on April 2nd, in the same year, presumably near the same place.

The Rev. P. A. Keating, of Waterford, Ireland, in *The Countryside* for 29th February, 1908, recorded that on 12th February, 1908, he heard the Cuckoo twice. On the 13th he heard it again, about 3 p.m., in the same locality. There were no persons about to imitate the voice, and even if they were, a trained ear could not be deceived. I have been an observer of bird-life for over forty years, and this, needless to say, is my earliest record. I may say, in passing, that Mr. Keating had seen a swallow in Co. Wexford on the 10th February in the same year.

In *British Birds*, January, 1921, page 184, Mr. J. Freeman states that he saw a Cuckoo at Queniborough, Leicestershire, on the 31st March, 1920. Mr. George Bolam, in *British Birds* for March, 1917, page 247,

makes reference to a Cuckoo seen near the Vicarage at Charlton by the Rev. J. Meggison on February 4th, 1877, and again next day, and yet again in the second week in March; and mention also is made of two young Cuckoos having been picked up by Mr. Calvert Chrisp in his garden at Hawkhill in November, 1876, and took them into his house, but they soon died, and Mr. Bolam adds they were both old friends of his, and he was quite satisfied that neither of them could mistake a Cuckoo for any other bird.

In *The Naturalist* for 1894, page 157, Jas. W. Addyman, Starbeck, Yorks., writes that he and Doctor Jackson heard the Cuckoo distinctly and unmistakably on the 27th March, 1894, in the woods bordering the Nidd at Killinghall Bridge, and neither of them entertained the slightest doubt on the point.*

Quite a large number of instances could be given, if necessary, of Cuckoos having been seen in late autumn and even winter. A recent and absolutely reliable record is given in *British Birds* for March, page 243, in which it is stated that Mr. J. F. Gee writes to point out that he shot a young Cuckoo in Delamere, Cheshire, on December 26th, 1897 or 1898, and Mr. Wetherby adds: Mr. Gee has kindly sent the bird for inspection. It is in juvenile plumage, with a few grey feathers on the head, and not further advanced in the moult than young birds often are in August or September. A record of a Cuckoo is given in *The Birds of Yorkshire* by my son, Rosse Butterfield, as having been killed on 5th November, 1902, at Horton, near Bradford. A few years ago, I think it was in 1917, I saw a Cuckoo in a valley near Baildon Moor, two or three times during the latter part of November and early December, when last I saw it it appeared to be eating the berries of the hawthorn.

In Mr. Coward's *Birds of the British Isles* he states that one of his friends shot a Cuckoo on December 26th. Writing in *British Birds*, Mr. Percy Harrison states that on December 1st, 1916, he saw a bird which he was able to identify with certainty as a young Cuckoo on the roof of Lydiard Millicent Rectory, near Swindon. The Editors remark that they believe this to be the latest date hitherto recorded for the Cuckoo in the British Isles, the latest previous record being November 26th, 1900, when one was obtained at the Skulmartin Lightship, co. Down. Many more instances could be given of the unseasonable occurrences of Cuckoos in Britain, but those quoted prove that Cuckoos may survive any month of the year during average seasons. Judging from old writers about the Cuckoo, one would think it almost, if not altogether, lived on hairy caterpillars, when, in fact, its bill of fare is a miscellaneous one.

Prof. Newton, in his *Dictionary of Birds* (page 119) says: 'Of no bird perhaps have more idle tales been told.' Yet on page 121 he states: 'Cuckoos, too, have been not unfrequently shot as they were carrying a Cuckoo's egg, presumably their own, in their bill, and this has probably given rise to the vulgar, but seemingly groundless, belief that they suck the eggs of other kinds of birds.' In spite, however, of what Newton says, the facts in support of the Cuckoo being guilty of sucking eggs of other birds are against his negative position on this question. The statement, on page 119, that 'whenever it (the Cuckoo) shews itself, it is a signal for all the small birds of the neighbourhood to be up in its pursuit, just as though it were a Hawk,' scarcely accords with my own observations. In this neighbourhood, at any rate, the pursuit by birds of the Cuckoo is confined almost exclusively to the Meadow Pipit, and the behaviour of this pipit in the presence of the Cuckoo is quite different from its behaviour in the presence of, say, the Sparrow Hawk. Newton further adds: 'Towards the middle or end of June its "plain song" cry alters; it becomes rather hoarser in tone, and its first syllable or

* See *The Naturalist* for June, 1922, p. 206.

note is doubled,' but it must not be inferred, as is often done in popular parlance, that this applies to all the individuals, for many remain in full song till nearly the time when they leave this country.

The late Charles Waterton once declared, in answer to the question whether a young Cuckoo could evict its foster brothers and sisters from the nest on the day after it was hatched—'That no bird in creation could perform such an astounding feat under such embarrassments,' but such a feat is now regarded by naturalists as an established fact.

In addition to those nests in which the Cuckoo lays its egg or eggs, mentioned in my paper at the beginning of this article, the following may be included: Linnet, Yellow Hammer, Robin, Pied Wagtail, Reed Bunting; and a correspondent writes me that he once found a fully fledged Cuckoo in the nest of a Wheatear which contained also two rotten eggs, and in the same piece of waste moorland he once found the nest of a Meadow Pipit in which three eggs of the Cuckoo had been laid—presumably laid by the same bird.



British Insect Life, by **E. Step**. London: T. Werner Laurie, Ltd., 264 pp., 10/6 net. Mr. Step's work is well known to our readers, and in the present instance the volume contains a typical description of insect life, which is illustrated by over thirty plates, including a fine coloured frontispiece. In addition to the usual fry, he describes Stone-flies, Thrips, Caddis-flies and other of the more uncommon forms. Each plate contains a number of different species reproduced from photographs. There is a particularly good index.

In Nature's Garden, by **C. H. Donald**. London: The Bodley Head, 241 pp., 7/6 net. The author describes Indian Natural History and scenery in an entertaining fashion; some of the articles having appeared in well-known Indian Journals. There is a fine collection of photographs of scenery, birds, nests and natives, and the nature of his narrative may be judged by the following three titles taken from the eighteen chapters: 'A Bear, Two Fools and a Dog,' 'His Excellency the Sarus,' 'Extremes in Sport.' There is a short Glossary at the end.

A History of Everyday Things in England, 1066-1799, by **M. and C. H. B. Quennell**. London: B. T. Batsford, 208 pp., price 16/6. In this excellent volume the authors have brought together precisely what the intelligent school boy or girl requires to make the study of history real and lasting. In a series of charming stories the growth and evolution of everyday things—costume, ships, castles, houses, halls, monasteries, carts, games, ornaments, etc., century by century, are given, and, what is more, illustrated by a wealth of drawings, including several admirable coloured plates, by the two authors, who know precisely how to interest elder children—a rare gift. This is the best work we have yet seen from their pens.

Woodland Creatures, by **Frances Pitt**. London: G. Allen & Unwin, Ltd., 255 pp., 12/6 net. We have previously had the pleasure of referring to a volume by Miss Pitt, and now another substantial publication from her interesting pen has been issued. It is written in the charming style which is hers, and illustrated by a large number of blocks from photographs of various forms of wild animal life. Her 'Woodland Creatures' include Badger, Rabbit, Squirrel, Dormouse, Fox, and, among the birds, Woodpeckers, Bullfinch, Sparrow Hawk, Kestrel, Magpie and Jay; other chapters being 'The Call of the Wild' and 'Birds of the Night.' Some of the articles have previously appeared in the reviews, but they are none the less welcome in their present form.

NEWS FROM THE MAGAZINES.

Camping, the June issue of which has just appeared, still continues to cheer us. We wish we could find time to take part in some of the pleasant rambles described.

J. H. Priestley and Edith E. North continue their Physiological Studies in Plant Anatomy, and Walter Stiles his work on Permeability, in *The New Phytologist* for June.

British Birds for June contains a paper 'On the White-billed Northern Diver as a British Bird,' by H. F. Witherby; 'Recovery of Marked Birds,' numerous valuable field records, etc.

In adjoining paragraphs, *The Publisher's Circular* announces the appearance of new issues of Thurston's 'The Green Bough,' and Frazer's 'The Golden Bough.' Neither is botanical.

An obituary notice, with portrait, of Henry Rowland-Brown, 'one of the best known and most popular of British Entomologists,' appears in *The Entomologist* for June. In the same journal W. J. Lucas gives 'Notes on British Odonata in 1921.'

A useful paper on 'The Determination of Lichens in the Field,' by W. Watson; an appreciation of the late E. A. Woodruffe-Peacock by the editor, James Britten; a paper on 'Two Alchemillas new to Britain,' and other interesting items, appear in *The Journal of Botany* for June.

The fourth part of *The Nature Lover* has appeared, and contains a Japanese Bird Study, The Wild Rose in Nature and Legend, Flowers in their Seasons, The House-fly, The Romance of the Whelk Shell, and Correspondence. None of the articles is signed, most of them quote poetry profusely. The editor is F. H. Shoosmith.

In describing 'A Palæolithic Flint' found at Earley (*Berks., Bucks. and Oxon Archaeological Journal*, p. 103), Mr. Hugh S. Spencer says: 'A Palæolithic implement in the British Museum, from near Great Gaddesden, Herts., is so similar in make and size that it appears to have been made by the same man as the above specimen.'

The Journal of Botany contains among its varied contents: 'A New Variety of *Orthodontium gracile* Schwaegr.' by W. Watson; 'Further Notes on Elm Flowering,' by Eleonora Armitage; 'New or Noteworthy Fungi,' by W. B. Grove; 'Notes on Charophytes,' by G. R. Bullock-Webster; 'Note on a Moss in Amber,' by H. N. Dixon.

In *The Entomologist's Monthly Magazine* for June, Mr. G. T. Porritt contributes 'Critical Notes on the Hon. H. Onslow's paper: Melanism in *Abraxas grossulariata* var. *varleyata*'; F. V. Theobald describes 'An Aphid Genus and Species new to Britain (*Trilobaphis caricis*)'; and A. E. Bradley refers to 'Variation in the genus *Psithyris* Lep. in the neighbourhood of Leeds.'

The Essex Naturalist, issued in March, contains the following: 'British Freshwater Planarians (*Tricladida*),' by Henry Whitehead; 'The Sparrow-hawk and the Goshawk in Litigation in the 12th and 13th Centuries,' by Wm. E. Clegg; 'Notes on the Occurrence of the British Trap-door Spider in Epping Forest,' by H. Main; and 'The Rosy-marbled Moth in Britain,' by C. Nicholson, etc.

The Geological Magazine for June contains a description of an enormous screw-like object from the Wealden, to which the name *Dinocochlea ingens* is given by Mr. B. B. Woodward, who considers it to be molluscan. It is over seven feet in length. On account of the difficulties which Mr. Woodward himself recognises, we feel sure *Dinocochlea* is not a shell, though, of course, it is necessary to describe and name it. Dr. Trueman has a useful paper on 'The Use of *Gryphaea* in the Correlation of the Lower Lias'; the correspondence columns contain sledge-hammer blows at the Geological Society of London and one of its prominent members; which, whether these are deserved or not, have given the journal an interest of quite a new character!

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Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by
A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
July 1st, 1922.

AUG.-SEPT., 1922.

Nos. 787-788
Nos. 561-2 of current Series

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

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AND

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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

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RILEY FORTUNE, F.Z.S.

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The ANNUAL MEETING will be held at Scarborough from September 22nd to September 25th. Details will be forwarded to members intending to be present. There will be no difficulty in securing accommodation at this period.

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NOTES AND COMMENTS.

SKEGNESS.*

We are informed on the title page by the author of this book (who is also the publisher and a 'F.B.P.S.'—whatever that may mean) that it is 'A Topographical, Historical *and Entertaining* Account of this Popular Lincolnshire Resort and Places within easy access.' It is 'Entered at Stationers' Hall,' though one wonders why. Of its 272 pages, 56 are devoted to Skegness, ancient and modern, mostly modern. There are illustrations of the author (*frontispiece*), of an energetic cyclist with whiskers, of three policemen with medals; of 'Ye Olde' Square (1860) and 'Ye Olde' Lifeboat House (1870), (at which dates the words 'Ye Olde' were not in use in that form); there are several illustrations from photographs of modern (very) Skegness. Still we much prefer the 'View of Skegness in Ye Sixteenth Century.' In this case the 'Sixteenth' should be '18th' if not indeed early '19th' century. The author should know that the long [f] is not f, and in quoting 'fo,' 'faid' and 'foup' he is using words which never were used. Under 'Interesting Events Summarised' we find 'New Sewerage Scheme,' 'Advertising Skegness,' 'Death of Mr. E. A. Jackson,' 'Sunshine and Rainfall,' and 'Poor Girls' Camp'—all 'interesting events'? This is not the author's first literary venture. He can tell 'How to Improve the Memory' for fourpence; 'What to Do and Where to Stay at Skegness' for threepence; and 'How to Choose a Wife, or Love and Courtship: a Genuine Guide to all desiring Happiness,' for twopence—which seems cheap!

EARL BUXTON ON PROTECTION OF BIRDS.

At the annual meeting of the Royal Society for the Protection of Birds, Earl Buxton stated there was one matter in which he feared there had been a backward trend of a serious and even menacing character. He alluded to the protection of eggs. Not only was the law on this point greatly in need of extending and strengthening, but it was exceedingly difficult to enforce even the limited protection now given, owing to recent growth in the craze for egg-collecting, accentuated by emulation and competition. He had no quarrel with the moderate egg-collector, who was often really interested in birds and in nature, and who confined himself to taking one or two eggs, leaving the remainder of the clutch to hatch out. But he did quarrel with those professional collectors who, either for gain or in the name of Science, or for any other reason, ruthlessly and in

* 'Ancient and Modern Skegness and District,' by G. H. J. Dutton. Skegness: Dutton Cash Stores, 6/-.

a wholesale manner filched the entire clutch. He especially deprecated such action in the case of rare birds. Some of these collectors did not appear to care by what means they obtained the eggs, nor did they pay much heed to the law.

EGGS AND THE EGG-COLLECTOR.

He would instance some recent cases cited by the British Ornithologists' Club in their own 'Bulletin,' No. CCLXI. It was there stated that on March 23rd, 1921, after the Oological Club Dinner, a member of the club displayed—presumably to admiring and probably envious colleagues—a 'remarkable exhibit,' consisting of 40 clutches of the Red-backed Shrike, all taken in one season, being the *full layings* throughout one season of no fewer than forty pairs of birds. It appeared also that the same person had already collected 500 separate nests of the same species at various times. Another collector exhibited on the same occasion a series of 24 clutches of the Spotted Flycatcher's eggs, stated to be from Kent, Radnor, and elsewhere. A third member of the Club showed a series of 14 clutches of the Pied Flycatcher, from Northumberland and Radnor. In his (Lord Buxton's) view the taking of clutches of eggs in this deliberate and wholesale way was altogether a wrong thing, and he found it difficult to believe that any additional or adequate scientific advantage was to be gained, or that any sufficient scientific justification could be made out for such action.

PROTECTION OF EGGS.

He must point out also that the eggs of both the Pied and the Spotted Flycatcher were protected in Radnor and Kent, and that the eggs of the Red-backed Shrike were protected in 24 counties. It would appear, therefore, that there must have been distinct infringement of the law by the collector or his agent. Moreover, the action of collectors who did these things under the name of Ornithologists constituted a direct encouragement, nay, a temptation, to the trading collector and dealer to rob nests and to trouble little about the law. He would therefore ask members of the British Ornithologists' Union (and he asked it in all friendliness, for he had great admiration and respect for ornithologists as a body) how they could justify these depredations and the example they set to others by their action. Public opinion must be expressed. Thanks to public opinion, Egrets were being saved from extermination abroad; and public opinion would, he believed, insist on the law being observed and strengthened in order to prevent wild birds of the United Kingdom from being exploited or possibly exterminated, or our bird life impoverished, by collectors, whoever they might be.

ART MUSEUMS.

Art museums in America seem to be fostering art, if we may judge from the following letter received from a prominent official in New York :—‘ The artistic wave, which is sweeping over the city,’ writes the agent, ‘ is having precisely the same effect on its business men as a similar artistic development had upon the population of ancient Greece. Every public-spirited citizen is now striving to make New York beautiful. Therefore, I submit to you a request of one of my clients, an automobile concern of high reputation, who has asked me to obtain for him the use of West Side Metropolitan Museum of Art for the purpose of advertising his latest car. With commendable civic interest, my client proposes to beautify the building by painting thereon, in immense size, a suitable woodland scene to delineate an attractive roadway passing through woodland glens, with, if the city wishes, a little river in the background. The motor-car, of course, will figure in the roadway, the letter intimates, and ‘ to avoid suggestion of the city’s lending itself to the advertising of a cheap automobile the name of the latter is painted on the side in large letters.’ ‘ The car,’ the letter concludes, ‘ should certainly have occupants, or it would look abandoned. My client, therefore, suggests that for the sake of educating the youth of the city one, at least, of the occupants should be a prominent city official.’

DESTRUCTION OF ORCHIDS.

We take the following from the press :—Upper Wharfedale district has been known for 200 years as the habitat of the ‘ Lady’s Slipper ’—*Cypripedium*. Mr. W. H. Stansfield, of Shepherd’s Bush, with Dr. Stansfield, of Reading, known as a leading authority on British ferns, found 17 plants growing wild last year. Mr. Stansfield writes to say that a visit last month showed that all these plants had been dug up and removed by people for whom no punishment would be too great. But he understands that Mrs. Miller, hostess of the Falcon Inn, Arncliffe, still has a fine specimen of this rare and beautiful plant with seven blooms in her garden.

AN INSPIRING GEOLOGIST.

Professor Percy Fry Kendall, who has just retired from the Chair of Geology at the University of Leeds, has been the recipient of gratifying tributes upon the occasion. Recently the staff of the University entertained him to dinner, and later a gathering of no fewer than thirty-six of his old students, including members of His Majesty’s Geological Survey, entertained him at a social gathering in Leeds. Since then, at a large gathering at the Philosophical Hall, Leeds, he was

presented with an illuminated address and a cheque for £250. This tribute had been subscribed for by 206 geologists, including many of the most distinguished geologists in the country, and especially by members of the county and local societies in Yorkshire, and was handed to Prof. Kendall by Mr. J. W. Stather, F.G.S.

THE ADDRESS.

Mr. Godfrey Bingley presented an illuminated address to Professor Kendall on behalf of the subscribers. The address was in the following terms:—‘ We whose names are appended desire, upon the occasion of your retirement from the Chair of Geology in the University of Leeds, to express our esteem and regard for you, and our appreciation of your great services to science. During the thirty years in which you have made Yorkshire your home, your influence has been deeply felt as inspiring teacher, indefatigable worker, and brilliantly original thinker. Nearly every geological formation which goes to the building of Yorkshire has received illumination from your researches to the advantage both of pure science and of its economic application. We recognise you as one of the founders and foremost students of modern Glaciology, and one who by your insight and imagination has endowed many of our north-country dales with romantic interest. Your studies of the Carboniferous Rocks have led, and are leading, to a wide extension of the exploited coalfield of Yorkshire and the Midlands. Your intimate understanding of the conditions under which the Coal Measures were accumulated has afforded means of diagnosis of the nature of anomalies in the coal seams of the English coalfields, hardly less important in practical effect. Most of all do we desire to acknowledge the kindness of your friendship, and the stimulus which your good fellowship and unselfish assistance have exerted upon the amateur pursuit of geological science in all parts of the north of England. We trust you may enjoy many years of health and continued usefulness.’

STUMP CROSS CAVERN.

A little while ago some of the Yorkshire papers occupied much of their space by accounts of some ‘ remarkable discoveries ’ near Pateley Bridge, by persons described as ‘ spelologists ’ (*sic*). The caverns are said to be ‘ equal to the finest of the Mendip caverns, hitherto claimed as the finest examples of stalactite caverns in Great Britain. The party had been “ investigating ” for a fortnight, and one told a “ fascinating story of subterranean exploration.” One ‘ struck a small hole ’ ; another was ‘ spiked in the back by stalactites ’ ; others found ‘ serac formations.’ Names have been given to different parts of the ‘ discoveries,’ such as

Long's Gallery, Long's Organ, Barton's Cavern, Aster Column, and so on. But we await the scientific results of these 'explorers' who 'face unknown risks of danger and frequently endure much discomfort.' True, a photograph has been published, but no scale was given, and the 'pillars' may merely have been inches in length. We await further details before forming an opinion of the scientific importance of the recent 'researches.'

SOFT CHERT.

More recently the press has given details of further 'investigations,' 'researches,' and 'explorations and surveys' in the Stump Cross Cave, and judging from the extravagance of adjectives, the article has been inspired by the same 'clay-encrusted speleologist.' We learn that 'a number of boulders was removed, giving access to a large canyon cleft, which, in the meagre candle-light, seemed to soar away up into gloom and mystery. Between the explorers' feet yawned a narrow but deep chasm, up which came the roar of rushing waters. With the help of magnesium ribbon, the black, foam-flecked stream could be discerned many fathoms below. Further investigation was postponed till the next day, when the full (*sic!*) party returned. A descent of the cleft was made to the level of the stream, which revealed the startling fact that the direction of the flow of the water was almost opposite to the main trend of the caverns. At this point work was abandoned for the day, owing to an accidental fall of rock which nearly involved the loss of three lives,' but did not. There is news of swirling streams, subterranean watersheds, and we are told that it is intended to 'survey the whole system accurately' (not a bad idea!); 'by means of eosin, sodium hydroxide, or phenolphthalia.' One observation, if correctly made, may have some scientific significance, viz., 'the appearance of vertical veins of black chert, which in parts is of a soft, almost plastic nature.'

THE MUSEUMS ASSOCIATION.

The Annual Conference of the Museums Association was held at Leicester from July 10th to 15th, and was well attended by delegates from various parts of the British Isles, and from Canada, the United States and France. Papers were read dealing with:—'Means of Raising Money for Museum Purposes,' by Mr. F. Leney; 'Museum Labelling and Printing,' by Mr. A. T. Roberts; 'The Fading of Museum Specimens,' by Sir Sidney Harmer; 'A New Spirit proof Cement,' by Dr. G. H. Murray; 'The Use of Croid and the Labelling of Spirit Preparations,' by Dr. J. J. Simpson; 'Taking Casts of Fossils,' by Dr. F. A. Bather; 'Classification of Derby Porcelain,' by Mr. F. Williamson; 'A suggested Scheme

whereby Museums and Libraries might be of mutual assistance,' by Mr. R. W. Brown; 'The organisation of Picture Exhibitions in the Provinces,' by Mr. E. R. Dibdin; 'The Cleaning and Restoration of Pictures,' by Mr. E. Howarth; 'The Case for a Royal Commission on Museums,' by Mr. J. Bailey. Mr. Leney's scheme was a Committee of 'Friends of the Museum,' who subscribe funds to enable specimens to be purchased on short notice, without calling upon the rates, and many valuable objects have been added to the Norwich Museum in this way. The questions of labels and the fading of Specimens were particularly useful, and Mr. Dibdin's scheme for the organization of picture exhibitions in the provinces was valuable. At the final meeting, Mr. T. Sheppard was elected President of the Association, and it is hoped that next year at least one or two days will be spent in Hull, in order to give the members of the Association an opportunity of visiting the Museums. The Leicester Museums have recently been entirely rearranged and redecorated, fitted up with new methods of lighting, etc., and in these connexions, many useful lessons were learnt. The Conference was particularly successful, and Mr. E. E. Lowe and his numerous friends all worked well to make the meeting successful.

PILTDOWN SKULL AGAIN.

In *Discovery* for July, Mr. E. N. Fallaize, Hon. Secretary of the Royal Anthropological Society, has an article with the somewhat startling title, 'New Light on the Piltdown Skull.' This, it seems, is a summary of some recent work by Professors Elliot Smith and Hunter, which as a 'new construction generally is confirmatory of the accuracy of the earlier reconstruction of Dr. Smith Woodward and Mr. Pycraft. The result, as Professor Elliot Smith pointed out, is a skull like no other skull; but its assimilation to the simian skull brings it into complete harmony with the chimpanzee-like jaw. The difficulty which arose from the discrepancy between the cranium and jaw has thus been completely and satisfactorily resolved, while the endocranial cast, as might be expected, takes up its place between that of *Pithecanthropus erectus*, the fossil skull from Java, and that of the recently discovered Rhodesian Man.'

THE CUCKOO'S CHANCE.

We learn from *The Spectator*, in reference to Mr. Chance's work on the Cuckoo, 'He tells us, incidentally, that he has taken hundreds of cuckoos' eggs, and he speaks of other collectors as having done the same. What of the Wild Birds Protection Acts? It is true that the cuckoos' eggs are not protected in every county, but the bird itself is protected in all. And what is the use of making it illegal to kill the

parent bird if collectors are allowed to destroy all her eggs? For this is what in many cases they are doing to-day, and not only with the cuckoo, but with other birds. Is it not time to amend the law?

NIGERIAN FORAMINIFERA.

Bulletin No. 3 of the Geological Survey of Nigeria contains a report on 'Foraminifera from the Eocene Clay of Nigeria' by E. Heron-Allen, F.R.S., and A. Earland, from which we learn that 'the sample, limited as it was, has furnished a few very distinctive and interesting forms, one of which, at least, *Virgulina schreibersiana* var. *marginata* may safely be described as new to science. The two Miliolids, *M. sulcifera* Roemer and *M. bicarinella* Reuss. are interesting, as not having been recorded again since they were first described and figured by their authors. The occurrence of *Peneroplis carinatus* d'Orbigny, which we recorded from the Eocene of Selsey Bill, is noteworthy, as also is the fact that the only representative of *Bulimina* is found in *B. fusiformis* Williamson, which must be abundant in the deposit. We record also the typically cold-water species *Globigerina pachyderma* Ehrenb., which also occurred at Selsey. The Nonioninae are interesting but involved, the species running into one another and exhibiting an extraordinary tendency to limbation of the sutures; this tendency is noticeable also in other species, notably in *Pulvinulina brongniartii* (d'Orb.) and *Bolivina textilarioides* d'Orb.' It seems remarkable that specific identification can be established between species which are so far separated geographically as Selsey Bill and Nigeria.

GAULT AND RED CHALK.

In a paper on the 'Overlap of the Upper Gault and on the Red Chalk,' in the *Geological Magazine*, No. 695, in referring to Yorkshire and Lincolnshire, Dr. F. L. Kitchin and Mr. J. Pringle states: 'In Yorkshire the extension of the overlap of the "Red Chalk" on to older rocks is well known. At North Ferriby we have examined the relation of the transgressive beds to the substrata, and find that they there rest upon a clay belonging either to a basal Kimmeridge or Upper Corallian zone. At South Cave the "Red Chalk" probably lies on Corallian clay. At that locality *Inoceramus sulcatus* and *Ammonites rostratus* were recorded by Hill, who also noted the occurrence of *Inoceramus sulcatus* at Wharram Grange. At Market Weighton, where the base of the Red Rock is markedly conglomeratic, it can be seen resting on the clays and ironstones of the Lower Lias. Mr. T. Sheppard kindly drew our attention to a newly made opening at the Rifle Butts in the Goodmanham Valley, and accompanied one of us on a visit to this locality. It was observed here

that the basal transgressive bed contained constituents of variable character, including much oolitic material.

SPEETON.

' Along the northern border of the Wolds the formation is seen to change, and at Speeton there is a thin basal series of variegated marls only some 3 ft. 6 in. in thickness, overlain by about 30 feet of red and mottled nodular marly Chalk. These red strata were for long considered to be an expansion of the Hunstanton Red Rock. Jukes-Browne, who formerly adhered to this view, afterwards placed 28 feet of these beds in the Lower Chalk (*varians*-zone). On the occasion of our visit to this locality we were fortunate in seeing an exposure of the marls below this red Lower Chalk. We were able to confirm in the main the details given by Mr. Lamplugh in 1889. We saw the glauconitic seam with eroded nodules resting directly on the black Aptian clay. Within the lowest foot we noticed the presence of *Inoceramus sulcatus* Park. and a few other lamellibranchs, all poorly preserved. The streak of dull reddish clay above this was readily recognised. In the uppermost 2 feet of marly shale were found numerous specimens of *Iconeramus anglicus* Woods and impressions of hoplitid ammonites. These marls belong to the Upper Gault, a fact proving that there is a non-sequence between them and the Aptian clays below, representing a considerable gap in time.'

MR. LAMPLUGH'S VIEWS.

' This is contrary to the view put forward by Mr. Lamplugh, who considers that the Speeton Clays most probably form an unbroken series from the Kimmeridge Clay to the Upper Chalk. The base of the Spilsby Sandstone lies discordantly upon the Kimmeridge Clay in Lincolnshire, where the whole of the Portland Beds are absent. A continuation of the same unconformity, between the Upper Kimmeridge Clay and the base of the Lower Cretaceous clays, is evidently marked by Bed E at Speeton, where the Portland zones are likewise unrepresented. The Lower Cretaceous clays of Speeton are thus limited below and above by non-sequences of some magnitude. It must be recognized that the transgressive Upper Gault, represented to the west of the Wolds and in Lincolnshire in the form of Red Rock, has here assumed a different aspect. In this connexion it may be remembered that at Holkham Hall, about 12 miles eastward from Hunstanton, a comparable change has been recorded. A well-section showed the presence of clay, described as Gault, beneath a "Red Marl." The thin bed of smooth, red marly Chalk overlying the Upper Gault marls at Speeton, and forming a passage to the Lower Chalk, seems to have yielded no distinctive fossils. Our examination of the reddened and

mottled chalk above satisfied us that the allocation of those beds to the Lower Chalk by Hill and Jukes-Browne was correct.'

CUP AND RING MARKINGS.

The following appeared in the press during the printers' strike, which may be responsible :—' Theories on Ilkley Cup and Ring Rocks.—Speaking at Ilkley, Mr. J. N. Size suggested that the cup and ring carved rocks on Ilkley Moor might be really maps of stars with rings round those of greater magnitude. Sir Sydney Oliver, who was present, remarked that there was evidence of a great migration across Europe of a people who buried their dead along with a *gun*. Was it possible, he asked, that these people had buried their dead in this country and carved a cup on the rock in default of the original article.'

A NEW MAGAZINE.

The Review of Applied Mycology is intended to afford a monthly survey of the more important recent literature dealing with the diseases of plants, excepting those caused by animal parasites, and also to contain references to work on other aspects of applied mycology. It is not intended to cover exactly the same field as *Botanical Abstracts*, which remains the only journal that aims at giving a complete citation of all mycological and phytopathological literature, but will be specially directed to supplying to workers with restricted library facilities sufficiently full abstracts to enable them to keep informed of the progress of current work.

AN EXHIBITION.

The exhibits that the Union are arranging in the Council Room of the Education Office, Albion Street, Hull, on the occasion of the British Association Meeting, Sept. 6th—13th, seems likely to be a representative display, and well illustrative of the extraordinary variety and intensity of the natural history work carried on by our members. On September 8th, at 5 p.m., Dr. Woodhead and the Officers and Members of the Union will be 'At Home' to members of the British Association interested in natural history, and, after tea, exhibitors will have an opportunity of demonstrating their work to the visitors. The exhibition will also be open between 10 a.m. and 5 p.m. throughout the meeting, and will provide a splendid opportunity for members of the Union to see for themselves something of the wide range and diversity of the subjects in which the Union is interested. Members of the Union and of its affiliated societies who can visit Hull during this time are strongly advised not to miss this opportunity, and at the same time, by payment of the small sum of £1, they can become members of the British Association for this meeting, and so enter a wider scientific

circle which their previous experience of the Y.N.U. is sure to render very congenial to them. The programme of the Geological, Botanical and Zoological Sections is full of interest to our members, and all sections and meetings can be attended by a member joining the British Association.

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Albino Crested Newt in Surrey.—An albino crested Newt was taken in a pond at Sanderstead, Surrey, on Friday, 30th June. Instead of the usual form, dark grey or blackish brown, with orange underparts blotched with black, the specimen is creamy white, with pink eyes.—K. NORRIS, Purley.

Liparis lucens Meign. on Phragmites communis at Strensall.—The cigar-shaped malformation of the reed caused by *L. lucens*, which was first observed in the North of England by Mr. Wm. Falconer, during the Y. N. U. Excursion to Askham Bog in August of last year, and reported by him in *The Naturalist*, 1922, p. 44, may now be placed on record as above. On July 16th, Mr. Sydney H. Smith and the writer visited the Common, where this gall was found in abundance in the bog pools east of the Rifle Butts.—F. A. MASON.

Cryptocampus medullarius Htg. at Huddersfield.—The discovery of the gall of *C. medullarius* in the Black Burn Valley, near Scammonden, re-establishes this insect as a local species. The previous record is from Storthes Hall, by Peter Inchbald, although recent investigations have failed to locate it there. On April 17th last, I found a bush of *Salix pentandra* in the above locality bearing a large quantity of this gall.—CHARLES MOSLEY.

The locality is within a very short distance from my house, and I have known the gall occurred there for close on four years. Its name is included with some three hundred others in a Huddersfield list which I gave to Mr. S. L. Mosley some time ago.—W. FALCONER.

More Yorkshire Hemiptera.—In compiling his list of Yorkshire Homoptera (*antea*, pp. 159-162), Mr. Fordham unfortunately missed a paper by Dr. J. W. H. Harrison on 'The Psyllidae of the Cleveland' (*The Naturalist*, 1915, pp. 400-1, indexed in error as pp. 403-4). This adds eleven species to Mr. Fordham's 114. I have further localities for many species, and, in addition, the following new records: HOMOPTERA: *Anoscopus limicola*, Hull; *Athysanus sahlbergi* Reut., Yorkshire side of Tees at Barnard Castle; *Psylla sorbi* Edw., Hayburn Wyke; *Chlorita viridula* Fall., Silpho Moor. HETEROPTERA: *Cyrtorrhinus flaveolus* Reut., Hull. *Calocoris alpestris* Mey., usually rare, has occurred to me in some numbers in Raincliffe Woods.—GEO. B. WALSH, Scarborough.

PLEISTOCENE AND LATER BIRDS OF GREAT BRITAIN AND IRELAND.*

ALFRED BELL.

MUCH of the following matter has been hitherto unpublished, and includes a second list of species from the Chudleigh bone cave, Devon, discovered by A. S. Kennard, F.G.S., and determined by E. T. Newton, F.R.S.; and a small series from the early ground near London Wall, also found by Mr. Kennard, and deposited in the British Museum.

The oldest of the series is certainly that found at St. Brelade's Bay, Jersey, in a cave now being investigated. The Paviland Cave is late palæolithic.

Roman sites have furnished a number, some of their own introduction such as Pheasant, Partridge, Guinea Fowl, etc.

To bring the paper up to date, the work of the editor in *The Naturalist* has been utilised.

- Song Thrush (*Turdus musicus* L.). Grimes Graves. Holocene : Dowkabottom Cave, London Wall.
- Missel Thrush (*Turdus viscivorus* L.). Hol. : London Wall.
- Fieldfare (*Turdus pilaris* L.). Cave : Chudleigh.
- Wheatear (*Saxicola oenanthe* L.). Cave : Chudleigh. Celtic : Glastonbury.
- Nightingale (*Philomela luscima* L.). Cave : Chudleigh.
- Dipper (*Cinclus aquaticus* Bechst.) Pleistocene : St. Brelade's Bay, Jersey.
- Cole Tit (*Parus ater* Penn.). Cave : Chudleigh.
- Great Tit (*Parus major* Penn.). Cave : Chudleigh.
- Grey Shrike (*Lanius excubitor* L.). Cave : Chudleigh.
- Chough (*Pyrrhocorax graculus* L.). Cave : Paviland, S. Wales.
- Jay (*Garrulus glandarius* L.). Cave : Chudleigh. Hol. : Hornsea (T. Sheppard).
- Raven (*Corvus corax* L.). Hol. : London Wall, Pevensey.
- Barn Owl (*Strix flammea* L.). Cave : Chudleigh.
- Buzzard (*Buteo vulgaris* Flem.). Hol. : Folkestone; Had- dington (J. H. Gurney.)
- White Headed Sea Eagle (*Haliaeetus albicilla* L.). Peat : Walthamstow. Hornsea (T. Sheppard).
- Kite (*Milvus actinus* Sav.). Hol. : Withersea (T. Sheppard).
- Kestrel (*Falco tinnunculus* L.). Pleist. : St. Brelade's Bay, Jersey. Cave : Ballynamindra, Ireland.
- Cormorant (*Phalacrocorax carbo* L.). Hol. : West Furze, Skipsea.
- Gannet (*Sula bassana* L.). Cave : Paviland, Gower, S. Wales.

* For previous list see *The Zoologist*, November, 1915.

- Heron Egret (*Ardea garzetta* Penn.). Hol. : London Wall.
 Grey Lag Goose (*Anser cinereus* Meyer.). Hol. : London Wall.
 Pink Footed Goose (*Anser brachyrhynchus* Baillon). Pleist. : St. Brelade's Bay. Neol. : Dunagoil, W. Scot. Hol. : London Wall.
 Domestic Goose. In barrow near Stonehenge.
 Barnacle Goose (*Bernicla leucopsis* Bechst.). Pleist. : St. Brelade's Bay, Jersey.
 Brent Goose (*Bernicla brenta* Pall.). Pleist. : St. Brelade's Bay, Jersey.
 Whooper Swan (*Cygnus musicus* Bechst.). North Lincolnshire peat (T. Sheppard).
 Mute Swan (*Cygnus olor* Gmel.). Burwell, and other Fens, Cambs.
 Wild Duck (*Anas boscas* L.). Skipsea.
 Teal (*Querquedula crecca* L.). Hol. : London Wall.
 Wigeon (*Mareca penelope* L.). Kirkdale. Hol. : London Wall.
 Pochard (*Fuligula ferina* L.). Celtic : Glastonbury.
 Eider Duck (*Somateria mollissima* L.). Whitrig bog, Wigton, N.B.
 Golden Eye (*Clangula glaucion* L.). Hornsea (T. Sheppard).
 Common Scoter (*Edemia nigra* L.). Tyree, N.B.
 Wood Pigeon (*Columba palumbus* L.). Hol. : London Wall.
 Rock or Stock Dove (bones not separable). Cave : Chudleigh.
 Capercaillie (*Tetrao urogallus* L.). Cave : Kents Hole.
 Black Grouse (*Tetrao tetrix* L.). Cave : Ballynamindra, Ireland.
 Red Grouse (*Lagopus scoticus* Lath.). Hol. : Corbridge (Romano-British).
 [A. Newton (Cambridge), 'Dict. of British Birds,' 1896, says he cannot distinguish between the bones from Teesdale and those of the Willow Grouse *L. albus*.]
 Hazel Grouse (*Tetraistes bonasa* L.). Cave : Chudleigh.
 Ptarmigan (*Lagopus mutus* Mont.). Pleist. : St. Brelade's Bay ; Shandon, Ireland.
 Pheasant (*Phasianus colchicus* L.). Hol. : Dalry, N.B.
 [Recorded as living in Scotland, A.D. 1554; in Ireland, 1559.]
 Partridge (*Perdix cinerea* Lath.). Hol. : Dowkabottom. Cave : Dalry, N.B.
 Red Legged Partridge (*Perdix rufa* Mont.). Pleist. : St. Brelade's Bay, Jersey.
 Guinea Fowl (*Numida meleagrina*). Hol. : Silchester.
 [Referred to by J. H. Gurney F.Z.S., in 'Annals of Ornithology,' p. 16, as occurring in the Romano-British site at Silchester. A leg bone is in the Reading Museum.]

- Domestic Fowl (*Gallus bankivus* Tessin.). Hol. : Pevensey, London Wall, Dalry.
- Moorhen (*Gallinula chloropus* L.). Pleist. : St. Brelade's Bay, Jersey.
- Crane (*Grus communis* Bechst.). Hol. : Norwich, London Wall, Corbridge.
- Plover, sp. Hol. : Pevensey.
- Oyster Catcher (*Haematopus ostralegus* L.). Hol. : Pevensey.
- Woodcock (*Scolopax rusticula* L.). Hol. : Pevensey.
- Common Gull (*Larus canus* L.). Hol. : Pevensey.
- Curlew (*Numenius arquata* L.). Hol. : Pevensey.
- Bar-tailed Godwit (*Limosa lapponica* L.). Cave : Chudleigh. Hol. : London Wall.
- Shearwater (*Puffinus* sp.). Celtic : Glastonbury.
- Guillemot (*Uria troile* L.). Cave : Paviland.
- Black Guillemot (*Uria grylle* L.). Cave : Chudleigh.
- Great Auk (*Alca impennis* L.). Pleist. : St. Brelade's Bay, Jersey. Hol. : Rosapenna, Donegal.
- Puffin (*Fratercula arctica* L.). Cave : Chudleigh.
- Great Crested Grebe (*Podiceps cristatus* L.). Cambridge Fens.

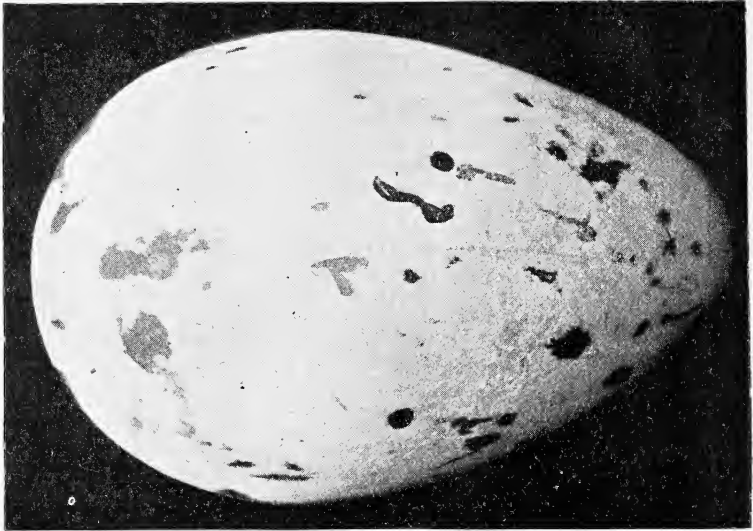
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Nature Photography : British Mammals and Birds. 174 pp. This book certainly has a chapter on the camera, etc., but most of it is occupied by 'Where our summer migrants spend their winter,' 'Some British Birds,' and descriptions of various species, apparently taken from previous writings of this author. On the wrapper it states the book is by **Westell** and **Sedgwick**, but on the title page the former is given in very large type, while the second in small type states that illustrations and notes are by him. **British Natural History Studies.** 118 pp. Similar remarks to the preceding also apply to this volume. **Stories of Deep Sea Fish**, by **Frank T. Bullen.** 194 pp. Most of our readers are familiar with the character of Mr. Bullen's stories, and this book seems particularly liable to interest young readers. **Stories of Whales and Other Sea Creatures**, by **Frank T. Bullen.** 148 pp. This probably will prove the most popular of the four volumes mentioned, each of which is issued at 3/- net, has numerous plates, and is published at the Boy's Own Paper Office, 4 Bouverie Street, E.C.4.

Nature's Curiosity Shop, by **Richard Kerr.** 178 pp. From the same office appears this volume. It has some excellently coloured plates, and also numerous plain ones, and we can particularly recommend it to the notice of the young naturalist. The volume covers a wide field, and its nature may be judged from the following main headings : Advantages of the Study of Nature ; Remarkable Birds ; Marvels of Plant Life ; Marvels of Marine Life ; Mimicry in Nature ; Miscellaneous Objects. The coloured plates include those of the Dodo, Hornbills, The Roseate Spoonbill, American Flamingo, Green Woodpecker, The Apteryx of Kiwi and its Enormous Egg, Head of a young Heron, Dove Plant ; a Papago Indian sliced off the top of the Bisnaga Cactus ; Milking the Aloe ; The Snake Nut, and ten others. Bearing upon the alleged molluscan remains on page 240 of *The Naturalist* for July ; Plate XV. in this volume has an illustration of "Giant Corkscrews supposed to be marine plants fossilised found in the State of Nebraska." One of these seems to be almost identical with the Sussex specimen.

UNRECORDED EGG OF THE GREAT AUK.

THROUGH the kindness of a Devonshire naturalist we are able to give our readers an illustration of an egg of the Great Auk, which is additional to those referred to in the lists prepared by Messrs. Bidwell, Parkyn and others, and has not so far been figured or described. This specimen, together with many other 'curios,' was purchased at a sale some years



Unrecorded Egg of Great Auk. (Reduced).

ago, and is still in the possession of our correspondent. It will be seen from the photograph that the egg is sparsely decorated by blotches, which are black or blackish-brown in colour, with a few surface stainings of light yellowish-brown. The ground colour of the egg is white, with a faint tinge of cream. The measurements are: length, 116 mm.; greatest width, 78 mm.—T.S.

—: o :—

Coal: Its Properties, Analysis, Classification, Geology, Extraction, Uses and Distribution, by E. S. Moore. London: Chapman and Hall, v. +462 pp., 25/- net. In this volume the Professor of Geology in the Pennsylvania State College brings together a useful series of chapters dealing with most of the aspects of the coal industry, principally as they apply to North America, though there are some short chapters on Great Britain and other European countries. Great Britain is dealt with in less than a page. There are numerous illustrations and diagrams, for the most part well chosen.

THE KIRMINGTON DEPOSITS.

IN connection with the forthcoming meeting of the British Association, Mr. J. W. Stather and the present writer, recently paid a visit to Kirmington, in Lincolnshire, to inspect the pit which it is proposed to visit in September. The brick yard in the village is being worked by Mr. Harvey, the son of the man who gave us assistance when we were working in the pit 17 or 18 years ago.

The clay for brick making seems to be excavated in a somewhat haphazard fashion, and the removal of the gravel from the top of the clay, and an occasional excavation for the sand beneath it (presumably for building purposes), have left the brickyard in a somewhat untidy condition. While there is no clear section from the sand up to the boulder clay in any one part, there are one or two which give nearly the entire sequence, and at one side of the pit the thin bed of boulder clay is clearly in position, though covered by material thrown up when excavating.

Perhaps the best section occurs where sand is being removed at the present time. This reveals :—

Surface soil containing large flint cannon shot gravel, possibly thrown from previous excavations	4 feet.
Grey laminated stoneless clay	8 feet.
Flaky peat, with numerous remains of reeds, etc.	6 inches.
Tough lacustrine clay, with joints stained by iron	10 inches.
Descending into sandy clay, and then—	
Fine, ferruginous, sharp sand with flint fragments (these evidently frost-cracked).... ..	4 feet.

In one part of the section which had been worked out, the thin bed (1 foot) of boulder clay of the Hessle type, foxy-red in colour and rather friable, with few boulders, is seen. It yielded syenite, Cheviot porphyrite, and jasper.

Crossing the road to the north in the village, behind what is labelled as a 'knacker-yard' is a section which shows 3 feet of loose, foxy-red boulder clay, resting upon 10 feet of coarse, compact, flint gravel. This gravel is remarkable from the fact that it is very hard and difficult to quarry, and consists almost entirely of water-worn flints, so rounded as to give the name 'cannon shot gravel.' Among them are occasionally pebbles of quartzite, lidianstone, and other foreign material.

The upper part of this gravel has occasionally pipes, and the

section presents unusual features, as for 3 to 4 feet the flints have been fractured, presumably by frost, and are all in a perpendicular position. This appearance is most marked. In the lower section of the gravel it only rarely happens that a broken flint occurs.

It is noteworthy in this section that the boulder clay seems to thicken towards the top of the hill.

A full account of this section, with list of plant remains, etc., appears in *The Naturalist* for January, 1905 (pp. 15-18), and in the *Report of the British Association* issued in the same year.—T.S.

—: o :—

Songs of the Birds, by **Walter Garstang, M.A., D.Sc.** John Lane, The Bodley Head Limited, 6/- net.

What song the Sirens sang was a question that stirred the imagination of Sir Thomas Browne. In these days we are beginning to realise that there are equally stimulating questions closer to hand: for instance, the question what songs the birds sing.

It is true that probably not one in a thousand could distinguish between the song of a blackbird and the song of a thrush; but it is equally true that the number of those who are interested in 'nature' subjects is rapidly increasing. And of the thousands who cannot answer the question what songs the birds sing, there are doubtless many who would like to be able to do so. Therefore, I anticipate a merry sale for Professor Garstang's book.

In his introduction, Professor Garstang says that some naturalists have denied the possibility of reproducing in syllabic form the songs of birds; and points out that as regards the more primitive birds—the cuckoo, rook, duck, hen, and so on—this has already been done. His book is an effort to supply a notation for the outpourings of the more æsthetic songsters. Whether or not he has succeeded is for his readers to judge.

My own opinion—speaking as a barbarian and not as a naturalist—is that in some cases he has succeeded, and in others he has failed. He himself admits that the first necessity is to capture the rhythm of the song; not the tone. The country-folk have already done this in many instances. I cannot imagine a combination of syllables that would more easily identify the song of the yellow-hammer than—

'A little-bit-o'-bread-and-no-chee-eese.'

Then there is that delightful story, which the Professor relates, of the little schoolgirl who declared that a certain thrush of her parish was so insistent in its calls for 'Mrs. Hewitt, Mrs. Hewitt,' that Mrs. Hewitt herself opened her cottage door and answered 'Yes!' Who now can fail to recognise the song of the thrush?

The interpretation of the lark's song seems very successful; but we barbarians already know what the lark says. I would ask Professor Garstang to imagine one of us sitting behind a hedge trying to identify a Garden Warbler by means of this little jingle—

'Joo riddy, joo-reedy, joo-riddy, joo-ay-zo;
Wayzo, Wayzo, Diddo-deroo.'

I fancy we should sit, and sit, and sit.

All the same, this book forms an excellent introduction to a fascinating subject. Mr. J. A. Shepherd's illustrations lend the book such a charm that I cannot imagine any naturalist not buying it.—E. APPLETON.

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The 303rd Meeting will be held at **BUCKDEN**

For a Mycological Investigation of the
District, from Saturday, September 30th,
to Thursday, October 5th, 1922.

Chairman of Mycological Committee :

HAROLD WAGER, D.Sc., F.R.S., F.L.S., Leeds.

Hon. Secretary :

A. E. PECK, "Tosti," 20 Avenue Rd., Scarborough.

HEADQUARTERS will be at the Buck Inn, Buckden, Skipton. Proprietors, Messrs. C. and A. Varley. Terms 10s. per day. Members should write direct to book their rooms, saying whether they are willing to share a bedroom. It is believed that the "Township Hall" will be available for work and exhibition purposes. This is suitable and convenient in every way. The nearest Railway Station to Buckden is Grassington, Midland Railway. Motor vehicles meet all trains on arrival from Skipton.

THE DISTRICT.—The area to be investigated is included in the one-inch Ordnance Survey Map, Sheet 20 (Large Sheet Series). Buckden is situated in Upper Wharfedale, 10 miles from Grassington, amidst fine scenery. The district is well wooded and possesses an interesting Fungus Flora. For an account of the last "Foray," held here in 1916, see *The Naturalist* for March and April, 1917. Over 300 species were then recorded, a number being new to Britain.

PERMISSION to visit her estate has been kindly granted by Miss E. A. Compton-Stansfield.

LECTURES.—On Saturday evening, Mr. Jno. Crowther, the Museum, Grassington, has kindly offered to address members on a subject of local interest, "The Antiquities of Upper Wharfedale." On Monday evening, the Chairman (Dr. H. Wager, F.R.S.) will deliver an address entitled

"THE ACTION OF GRAVITY ON FUNGI."

Addresses on mycological subjects will be given on other evenings by the Secretary (A. E. Peck), W. N. Cheesman, J.P., F.L.S., and F. A. Mason, F.R.M.S. Contributions from other members will be welcomed by the Committee. The titles of same should be communicated to the Secretary, who will arrange a time for their delivery.

Mycologists should bring books, microscopes, etc.

FURTHER MEETINGS of the Union are as follows :—

Botanical Section, Annual Meeting, at Leeds, Saturday, 7th October, 1922.

Conchological Section, Annual Meeting, at Leeds, Saturday, 7th October, 1922.

Geological Section, Annual Meeting, at Halifax, Saturday, 14th October, 1922.

Entomological Section, Annual Meeting, at Leeds, Saturday, 21st October, 1922.

Vertebrate Zoology Section, Annual Meeting, at Leeds, Saturday, 28th October, 1922.

ANNUAL MEETING of the Union, at Scarborough, 9th December, 1922.

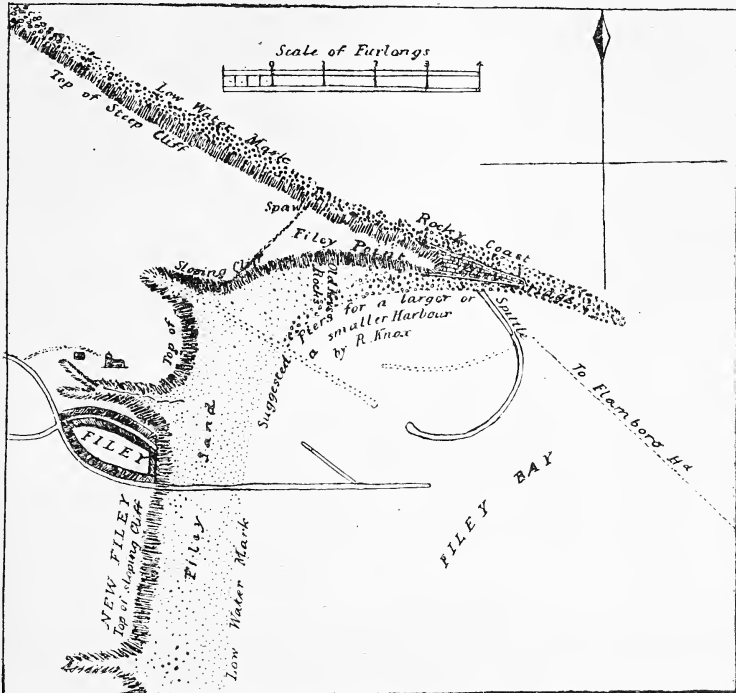
These dates, etc., are subject to such alterations as may be necessitated by local considerations.

EXHIBITION.

An Exhibition, illustrating the work of the various sections and committees of the Yorkshire Naturalists' Union, will be arranged by a sub-committee of that body, in connection with the Conference of Delegates, to be open during the Meeting of the British Association in Hull, September 6th to 13th, in the Board Room of the Education Offices, Albion Street, Hull.

THE SPITTAL AT FILEY BRIG.

On March 30th, taking advantage of a particularly low tide, Mr. F. Gerald Simpson, of the Yorkshire Roman Antiquities Committee, invited the present writer to make a preliminary survey of the seaweed-covered ridge extending from the south side of Filey Brig. We were early on the



Plan of Filey Brig with suggested Piers, etc., from Knox's 'Eastern Yorkshire.'

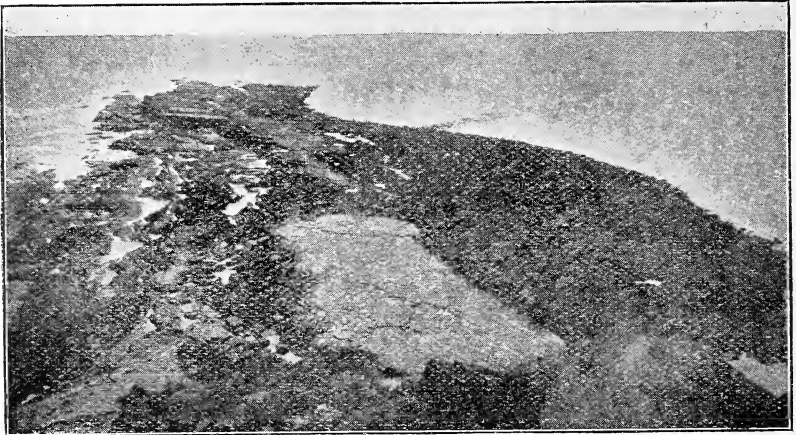
ground, and were joined by Mr. J. W. Stather, F.G.S., of Hull, and Dr. Irving, of Scarborough.

While awaiting the receding waters, an opportunity was afforded of viewing the Spittal in relation to the geological and geographical features of the district. At the outset, it was apparent that it could have no direct geological connexion with the Brig proper: its position, if contemporary with the Brig, could only be accounted for on the assumption of a 'fault' or other disturbance. Fortunately, the remarkably clear and unbroken ridge of rock forming the Brig showed conclusively that no such feature could exist.*

* Some of these details have already appeared in *The Yorkshire Post*.

So far as the necessarily brief examination afforded by the tide permitted, it seemed quite evident that the Spittal was not connected, geologically, with the Brig. It apparently consisted of a comparatively flat-topped ridge, 20 feet or so in width, and 200 yards in length, and we were assured by the Filey 'Cox' and other fishermen that there was a steep face to the ridge on its south-west face, about 15 feet in depth, whereas on the opposite or seaward side the depth was only about 5 feet, and gradually shelved to deeper water.

It was noticeable that on the lower part of the dip-slope of rock there was an enormous mass of boulders derived from the weathering of the adjacent rocks. These seemed to be held in place on the slopes of the Brig from the point of Carr



Filey Brig from Carr Naze, at low spring tide, showing the line of the Spittal on the right.

Naze to the Spittal, whereas precisely at the latter position the accumulation of boulders disappeared, and the line of the Spittal clearly seemed to be a continuation of the curved line of boulders. This was borne out by the evidence of the Filey fishermen, who averred that the scour of the incoming tide in the bay formed a huge whirlpool, along the side of the Brig, and again to the south. This being so, the Spittal may be accounted for as a 'cranch' or bank of boulders formed as the result of tidal action, just as cranches occur at the mouths of rivers and estuaries, and in the same way as Spurn Point and Selsey Bill were formed. Bearing upon this, the direction of the Spittal, namely, south-south-east, is in keeping with this theory, whereas, if it were an artificial pier, the direction would surely be at right-angles to the Brig, or even south-south-west.

From the antiquarian point of view it seems clear that if, as alleged, there actually is a perpendicular or steep face to a depth of 15 feet, it is possible that the structure may be man's handiwork. So far tradition, which seems strong in certain quarters, is the only evidence of the artificial nature of the Spittal. True, on the top of Carr Naze, close by, the remains of a Roman lighthouse or other look-out post have been found, and in its immediate vicinity sufficient Roman remains to justify the assumption that a Roman habitation once existed. These appear to be the only evidence of Roman occupation in the immediate district, and therefore the need for a port or quay in Roman times is not evident, particularly in view of the better accommodation at Scarborough, close by. On the other hand, however, the probability is that in Roman times the Boulder Clay cliff forming the Carr Naze was much further out to sea, if not indeed as far as the Spittal itself, in which case a pier at that particular point might be appropriate.

After very careful consideration of the whole question, on the spot, the conclusion was arrived at that before going to the expense of employing a diver to examine the alleged steep side of the Spittal, careful soundings should be made in order definitely to ascertain whether a steep wall-like side occurs. If such soundings indicate that the Spittal is a mere heap of boulders, probably tidal in origin, then it may be considered undesirable to expend further money on the search. If, however, the evidence thus produced gives the slightest indication of human workmanship, it would be desirable on a future date to employ a diver to investigate the steep face.

Provided it is eventually proved that the Spittal is of man's handiwork, the question of its date is by no means decided. That it is rumoured locally to be 'Roman' is merely in keeping with scores of similar rumours relating to objects dating from Neolithic stone axes to modern bread pancheons—both these having been described as Roman in recent literature.

We do know that during the Armada scare all sorts of temporary protective measures were taken along the coast, and it is not even improbable that, if artificial, the Spittal is of Elizabethan date, especially when we remember that that good Queen graciously gave permission to the people of Bridlington to use the stones of Bridlington Priory, unroofed and despoiled by her father, to be used for building a stone pier at Bridlington Quay.

That there is an impression that the Spittal may be of Roman date is shown by numerous references to it, though we need mention only two.

In 1855, Robert Knox published his 'Descriptions

Geological, Topographical, and Antiquarian in Eastern Yorkshire' (210 pp.), now a scarce book. He wrote, 'In this bay there is some evidence of an attempt having been once made by some long bygone people (possibly the Romans), to form a harbour in its bosom, but no proof exists of its having ever been completed. A foundation about two hundred yards in length, and thirty in width, drying at low spring-tides (composed of unshaped stones, each of which a man or two may carry), projects obliquely from the rocky ledge, Filey Bridge, and points 12 or 13 degrees within Flam-borough Head (or S. 36° E. true bearing). This foundation, which is named *Spittle*, was probably laid before any attempt to construct a harbour at Scarborough was made. But the castle-hill there, being always a stronger natural fortress than Filey Point (for in former ages one lawless tribe, without much provocation, invaded another), the harbour here was doubtless therefore abandoned, and one finally fixed at the foot of Scarborough castle-hill, which was afterwards improved from that town having become early privileged. The harbour at Filey was at all events left unfinished.' And on Plate 6 he gives a plan of the Brig, etc., showing the position of the Spittal and the way in which he considers it might be utilised. This plan (which is reproduced herewith) also shows the 'Old Keys Rock' referred to below.

Three years later Dr. W. S. Curtis printed some 'Remarks on the Discovery of Roman and British Remains at Filey,' in the *Transactions of the Scarborough Philosophical and Archæological Society*. He wrote, 'Somewhat beyond the middle of the Brig, striking off from it at an angle of 45°, we find the foundations of a pier or breakwater, now called the Spittal Rocks (from Hospitium?), and at the angle of the bay another work still known as the Old Key Rocks; when these works existed above high water mark, they would complete an excellent harbour for vessels of the size of Roman galleys; easy of access at all times of the tide, protected from every wind, and sufficiently capacious for one of their fleets. A few years ago there still existed here a stone to which the Roman sailors had often moored their galleys, and is even yet remembered as 'the old mooring stone'; it was a flat piece of rock projecting from the cliff, having through it a large hole worn by the frequent passing of ropes. It was some years since removed by some Goth, who attempted to get stone from Filey Brig, with which to build a pier at Bridlington.'

It is such reports as these, unsupported by a single scrap of evidence, which have given rise to the rumours as to the Roman origin of the Spittal. But zoological friends to whom I have spoken—who have known the Spittal for years, and

English Pilot' (c. 1716*), lent to me by Mr. E. R. Cross, is a map, which shows a pier or jetty in Filey Bay, but this is not on the Brig, but well to the west of Carr Naze, in the position of the old Key Rocks, already referred to. As a similar one occurs at *Flamborough*, another at Bridlington, it may be that this merely indicates a wood structure; in any case it is clearly not the Spittal.

On page 15 of this work are two references to Filey: 'Without the Head of Filey lies a rock under water, called Filey Bridge, or Krake, between it and the Peer you may lie afloat in 5 fathoms at low-water.' 'Four leagues to the westward of Flamborough Head lies Filey, in a round Bay to the southward of a Point: it has a Peer behind which you may ride.'—T.S.



We understand that London is to have the finest Aquarium in Europe. It is to be in the Zoological Society's Gardens, will cost £50,000, and about half this amount will be raised by selling the Society's property in Hanover Square. It is estimated that if a third of the Zoo's visitors pay sixpence for admission to the Aquarium, £10,000 a year will be obtained.

According to the *Daily Mail*, at the recent meeting of the Museums Association, 'Mr. E. Howarth explained that the old pictures were usually protected by a coat of varnish. After a certain period this varnish became discoloured, and it was necessary to remove the old varnish and apply a fresh coat. In the case of one picture by Constable, in the Sheffield collection, the painting had been thickly coated by varnish which went dark and began to crack. He removed the varnish by placing above the canvas a sheet of partly glazed brown paper and ironing it with an ordinary 4-lb. iron.' We don't think Mr. Howarth made any such statement, and we certainly do not recommend anybody to iron 'old masters.'

The Court of the University of Leeds has approved the recommendation that the honorary degree of Doctor of Science should be conferred upon the following:—Dr. C. G. Joh. Petersen, Director of the Danish Biological Station, Copenhagen; Professor P. Langevin, Professor of Physics, College de France, Paris; Professor P. Weiss, Director of the Institut de Physique, University of Strasbourg; Mr. L. de Broglie, Institut d'Optique, Paris; Dr. A. F. Holleman, Professor of Organic Chemistry, University of Amsterdam; Professor W. C. Brögger, K. Frederiks Universitat, Christiania. The Vice-Chancellor (Sir Michael E. Sadler) explained that these were six eminent men of science from abroad who would attend the meeting of the British Association at Hull in September next, and in conferring degrees upon them the University would be following the precedent set on the occasion of the last meeting of the British Association in Yorkshire. It was further agreed that discretion should be given to the Chancellor to add to the list in exceptional circumstances, it being realised that some other eminent men of science from abroad might come to the British Association meeting without the present knowledge of the University. It is proposed to confer the degrees in the University of Leeds, possibly in the library of the Medical School, on Wednesday, September 13th.

* See 'List of Papers, Maps, etc., relating to the Erosion of the Holderness Coast and to changes in the Humber Estuary,' by T. Sheppard (*Trans. Hull Geol. Soc.*, Vol. VI., p. 52).

THE PHYSIOLOGICAL ANATOMY OF THE VASCULAR PLANTS CHARACTERISTIC OF PEAT.

J. H. PRIESTLEY AND MILDRED HINCHLIFF.

THE characteristic appearance of a peat moor must be familiar to any observer of Yorkshire vegetation. Whether the area be dominated by *Calluna* or *Erica*, by *Eriophorum* or *Juncus*, the character of the plants remains the same; of stunted growth, dark green in colour, and of very leathery texture, with small leaf surface. More detailed examination reveals the leaves frequently inrolled, with sunken stomata and a thick cuticle; and such characters have led inevitably to the peat plants being grouped with xerophytic plants.

In botanical thought, dominated by the Darwinian point of view of natural selection, the attempt is usually made to explain form and structure in terms of fitness to surroundings, but in interpreting along these lines the peat plants, which occupy some of the wettest areas of the countryside, the ecologist is faced with a different problem. He has to explain why xerophytic structure is specially suited to such a wet habitat. The solution usually offered is that the water of the peat moor, though present in large quantity, is not available to the plant owing to its acidity. So far as we are aware, however, this argument has received little support from experiment.

The teleological point of view then in this case leads to difficulties not yet solved. It is therefore of interest to consider other lines of investigation, and in the present paper attention is drawn to certain other anatomical features characteristic of peat plants that have never yet been recorded, as far as the writers are aware, whilst a reason for their presence is suggested, which does not involve a teleological interpretation. - It may happen that the facts here considered may throw some light on the characteristic features of the form and anatomy already noted.

It has been stated already that an abnormally thick cuticle is a very constant feature of these plants. The cuticle of a plant consists very largely of cutin, a substance derived from various organic acids, mainly oxyfatty acids, which seem to occur partly condensed into complex molecules, partly as esters of the alcohols glycerol, phytosterol, and other higher alcohols (Priestley—2).

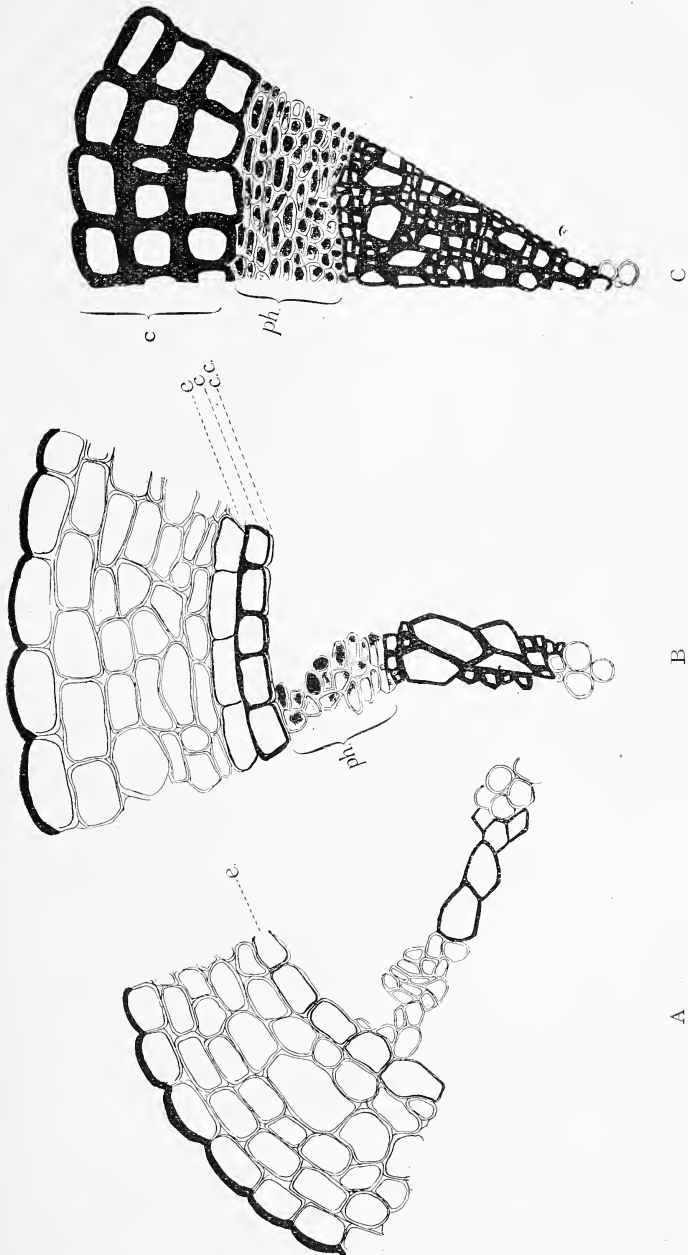
The rapid deposit of cutin on the young vascular plant of the peat moor suggests the presence of an abnormal amount of fatty acid. Anatomical investigation with the employment of micro-chemical methods confirms this assumption. Thus in *Empetrum*, *Calluna*, and indeed in practically every

plant examined, staining with Sudan III. revealed the presence of exceptional quantities of fats, especially in phloem and cortex. This examination brought to notice another anatomical feature which occurs in all these plants at a relatively early stage. Transverse sections of stems stained with Sudan III. show, as a very conspicuous feature, a ring of cells just outside the phloem region, in which each cell is lined with a deeply staining lamella, formed of a deposit of suberin over the internal face of the wall. Such a cylinder of cells constitutes a secondary endodermis (Priestley and North—3), and it is by no means of frequent occurrence in normal Angiosperm stems.

Suberin is closely allied to cutin and is likewise derived from a number of fatty acids by oxidation and condensation (Priestley—2). It is obvious, then, that the presence of a secondary endodermis in these plants of the peat habitat may be correlated with the excess of fats present in their tissues. The presence of this endodermis has marked effects on the growth of the plant. In the first place, as the impermeable suberin layer forms and consolidates, the cortical tissues external to the endodermis are practically cut off from the supply of water and solutes moving within the vascular cylinder. As a result, these tissues become dry and withered, the stem in this region assumes a brown hue, begins to disintegrate, and soon can be rubbed away, leaving exposed the cylinder of endodermis. Many observers must have noticed the fine dust raised during a tramp over the Calluna, *Empetrum* and *Erica* of our moors. Such dust, usually ascribed to the chimneys of an industrial district, will be found on examination to consist in the main of the withered tissues of the plants themselves. During desiccation, the withered tissues undergo chemical changes which appear to make their walls much more resistant to subsequent decay, and much of the brown detritus powdering the surface of the peat is apparently due to this cause.

Amongst the constituents of peat are also, of course, the remains of former generations of plants of similar anatomical structure. The tissues most resistant to decay are the fat impregnated tissues of cuticle and endodermis, and microscopic examination of peat reveals many such fragments. Indeed, if peat be submitted to saponification processes, a surprisingly large yield is obtained of the soaps of fatty acids (Priestley—2) *loc. cit.* p. 23).

Another result of the formation of a secondary endodermis is that in many species there appears at a later date a cork layer within the endodermis. The diagrams in text figure I. show the structural changes in the stem of *Empetrum nigrum*. A is a transverse section of the young stem showing



the endodermis (e); B shows a later stage with the layer of cork (c) arising from the cork cambium (c.c.) within the endodermis; C shows further development of the cork. The endodermis has now disappeared, having been burst asunder by the growth of secondary wood and cork, and rubbed away, together with the cortical tissues. In B and C can also be seen the heavy deposit of fat in the phloem (ph). It may be noted that when the endodermis disappears, its duties as a protective layer will be taken over by the cork layers formed within it. The exact relations of endodermis cork, and other tissues, vary from plant to plant, and in the Appendix will be found brief notes relating to plants from Yorkshire peat habitats which have so far been examined.

The point so far emphasized is that, in the peat plants examined, an obvious connection may be traced between the thick cuticle and heavy suberin lamella of the secondary endodermis, and the excessive amount of fat present in the tissues. It is now proposed to suggest a reason which seems adequate to explain the presence of this excessive fat deposit. The roots of peat plants are growing in a soil which is essentially deficient in oxygen. Observations seem unanimous on this point. If a root grows actively under such anaerobic conditions, one of the most effective sources of energy for its constructive metabolism would be found in the conversion of carbohydrate into fatty acid with elimination of some CO_2 . Such chemical changes are known to occur within the living organism (Leathes—1, *loc. cit.*, p. 107), and in this Department considerable evidence has been found for such activity in the root apex.

Behind the growing region these fatty acids seem either to be deposited upon the walls as insoluble calcium soaps, or to be carried up with the sap in the vascular cylinder as soluble soaps of potassium or sodium, or as free fatty acids.

If, then, this metabolic change is more predominant in roots growing in peaty soil, greater quantities of fatty acid will be formed here than in normal roots. Peat soil is notoriously deficient in calcium, so that we may anticipate that the acids are not precipitated in the root, but move upwards with the sap supply to leaf and stem. Here they accumulate at the surface in the abnormally thick cuticle, and later are deposited within the stem as the suberin layers of the secondary endodermis and cork. This explanation, if supported by further investigation, would incidentally throw some light upon the 'calciphobe' nature of the plants of a peat habitat, a subject which will be treated separately in another note from this Department on the significance of the

$\text{Ca}/\frac{\text{Na}}{\text{K}}$ ratio to the plant.

APPENDIX.

Notes on Microchemical Examination of Yorkshire Peat Plants.*

Calluna vulgaris Hull.

Clearly marked secondary endodermis, without gaps, in young green stems about one inch in length. Endodermis cells relatively large and conspicuous. Nearer the growing point, a primary endodermis with casparian strip is indicated. Older stems showed, external to the phloem, three or four rows of suberised cork cells within the endodermis; the cortex withering and easily crumbling away outside the cork. In the root, within the withered cortex, several layers of cork.

Erica Tetralix L.

In young stem a secondary endodermis present fairly early, in the older stem several rows of suberised cork cells form within this.

Andromeda Polifolia L.

The old stem showed a deep seated layer of cork, 3—4 cells deep, arising probably within a secondary endodermis. The leaf showed a remarkable quantity of fat deposits.

Vaccinium Myrtilus L.

A complete secondary endodermis within the young green stem, and just within this is a ring of sclerenchyma. In the older stem cork arises within this ring of sclerenchyma.

Vaccinium Oxycoccus L.

A well marked cork layer (3—4 rows) present in youngest stems available, it is deep seated and appears to lie within a tangentially flattened secondary endodermis, which is crushed between the cork and a ring of sclerenchyma just outside it in the cortex. Older stems showed thicker cork layers with the cortex disintegrating.

Empetrum nigrum L.

In the young stem, just behind the growing point, much fat was present in the phloem, but no suberin deposited in the walls outside the phloem. A little lower down, occasional cells of the endodermis showed a suberin lamella, a little lower again (within an inch of the tip) a complete secondary endodermis was present. This anatomical modification appears associated with a change in the colour of the stem from green to red. In older stems cork appears within the endodermis, and the cortex and endodermis begin to disintegrate and disappear.

Galium saxatile L.

A well marked cuticle and complete secondary endodermis even in the flowering axis.

Potentilla Tormentilla Neck.

Conspicuously large endodermis cells, with suberin lamella and casparian strip, present in the flowering axis.

Rubus Chamæmorus L.

No indication of secondary endodermis in the leaf stalk; relatively thin cuticle.

Ulex europæus L.

(Hardly a typical peat plant). In the soft green stem no indication of a secondary endodermis, although fat appears to be present in the phloem. In the older brown stem several rows of cork are present just external to the phloem, and in still older stems the outer cortex with its angular outline has rubbed away.

* Sections of many of these plants will be on view at the Y.N.U. exhibit during the British Association Meeting at Hull.

Scirpus caespitosus L. and *Juncus squarrosus* L.

A secondary endodermis around each bundle at the base of the peduncle.

Eriophorum vaginatum L.

A secondary endodermis around each bundle at the base of the peduncle and some evidence of a suberin lamella in a layer surrounding the whole central mass of bundles in the rhizome.

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Dr. Henry Fairfield Osborn favours us with his *Fifty-third Annual Report of the American Museum of Natural History*, which is a publication many British museums will envy, and has illustrations of several exhibits which British institutions might copy.

The Report of the National Trust for Places of Historic Interest or Natural Beauty (75 pages) contains a record of the Trust's properties, numbering nearly a hundred, in its charge; and of the way in which funds for the Society's laudable object are obtained.

The Thirty-first Annual Report for the Royal Society for the Protection of Birds, including the Proceedings of Annual Meeting, 1922 (76 pp.), is an excellent record of the useful work accomplished by this Society, work which is obviously appreciated judging from the enormous list of subscribers to the Society's funds.

The Annual Reports and Balance Sheet of the Huddersfield Naturalist, etc., Society for 1919-1920 (16 pp., 6d.) is to hand, and contains C. Mosley's Natural History Report, C. Wood's Antiquarian Report, E. Fisher's Report on Reptiles and Birds, C. Mosley's on Entomology, W. E. L. Wattam's on Phanerogamic Botany, and T. W. Woodhead's on Geology.

The Transactions of the Lincolnshire Naturalists' Union for 1921 contain the Rev. S. F. Alston's Presidential Address on 'The Ash'; a notice of the death of Rev. F. L. Blathwayt, with portrait; various reports on the year's work by A. Smith, J. F. Musham, W. Wallace, H. C. Bee, W. S. Medlicott, H. Preston, and F. Hind. There are also shorter notes.

Under the title of *The London Naturalist*, the London Natural History Society has published its Journal for 1921 (80 pp., 3s.). It is largely occupied by a clever paper on 'Structural Abnormalities in Lepidoptera,' by E. A. Cockayne; R. H. Fenton writes on 'The Cuckoo,' and there are reports of the various sections of the Society's work, all carefully written. The number is an unusually good one, and the abbreviated title will certainly be useful to Bibliographers.

The Report and Transactions of the Cardiff Naturalists' Society, Vol. LII., contains 'Meteorological Observations in the Society's District,' by E. Walford; 'The Triassic Rocks of South Glamorgan,' by F. F. Miskin; 'The Leek: The National Emblem of Wales,' by Eleanor Vachell; 'Ornithological Notes,' by G. C. S. Ingram and H. M. Salmon; 'Entomological Notes,' by H. M. Hallett, together with reports of the various sections of the Society's work.

PLANT DISTRIBUTION AND BASIC RATIOS.

W. H. PEARSALL, D.SC., F.L.S.

NUMEROUS enquiries as to the nature of 'sour' soils have led to the enunciation of various theories of soil acidity. Most of these theories explain in an attractive manner some single aspect of this complex subject, and most of them equally fail to give any clue as to how soil sourness affects plant life and the distribution of vegetation. The most reliable index of soil sourness still appears to be the character of the vegetation the soil bears, a vegetation in which ling, bilberry, cottongrass and the matgrass, *Nardus*, are usually predominant.

Using modern colorimetric methods (see Fisher, *Journ., Agric. Sci.* XI., 1921) of estimating soil acidity in terms of hydrogen ion concentration, the writer has been unable to find any very marked correlation between the acidity of a soil and the vegetation it bore. As a general rule, the heathy plants mentioned above are usually found on the more acid soils, while others (e.g., *Mercurialis*, *Brachypodium*) are common on the less acid soils. Widely exceptional cases, however, upset any exact generalisation. Moreover, when plants are grown in water cultures, no observable effects seem to be produced by changes of acidity of the order of those found in natural soils. It thus appears unprofitable to suppose that acidity alone is producing the observed changes in vegetation found on sour soils in nature.

Another idea, which has recently been restated by Clements, is that deficiency of oxygen is the characteristic feature of sour soils. To this one may object that waterlogged soils which are deficient in oxygen frequently exist, and yet do not bear heathy vegetation. Conversely, some examples at least exist of soils bearing this type of vegetation, and yet being well aerated. As an example of a not infrequent case, one often finds in the Lake District *Calluna* and *Nardus* growing abundantly on stream gravels, bathed either by stream or lake waters which are well aerated and nearly neutral in reaction. The peculiar feature about these waters is that they contain a high ratio of potassium and sodium to calcium and magnesium salts—and that in similar places near other lakes, where this ratio falls below 1.5, other plants colonise the stream gravels, these being plants usually found on normal fertile soils.

It seems that in this case, absence of calcium is the characteristic feature of the habitat and not acidity or oxygen deficiency. The application of this idea to all cases of soil sourness as known in the north of England seems quite justi-

fied. The process of leaching, from which originates soil sourness, is not one which acts on all the soil bases at the same rate. Analysis of drainage or of natural surface waters shew that lime (calcium) salts are removed most rapidly, potassium (and to a less extent sodium) most slowly. Leaching should therefore result in potassium and sodium becoming predominant in the soil complex rather than calcium (or magnesium). The accumulation of organic matter which usually accompanies leaching should lead to the same result, since these soil colloids absorb potassium (and sodium) more rapidly than calcium and magnesium. It seems, therefore, that sour soils are characterised normally by a high ratio of potassium and sodium to calcium and magnesium—a ratio which, for the sake of brevity, may be called the basic ratio.

The plants growing in sour soils are remarkable for the presence of large quantities of fats. Upon the basic ratio of the soil must depend, to a considerable extent, the mobility of the fats in the plant, for the ease with which substances are moved in or out of the living protoplasm of a cell is known to depend very largely upon the basic ratio. Such a movement is generally favoured by a high basic ratio, largely owing to the effect of the ratio upon the fats in the outer layers of protoplasm. Moreover, if potassium and sodium predominate, the fats form soluble and easily diffusible soaps which can be moved to all parts of the plant. If calcium is abundant, however, insoluble calcium soaps are formed, and the roots tend to become coated by an impervious layer of fatty origin, and unable, therefore, to carry on their absorptive function.

The distribution of fats in roots has been modified along these lines by Miss E. Bentley and Prof. J. H. Priestley. It seems therefore clear that a high basic ratio is a favourable factor in the growth of moor and heath plants.

The abundance of mobile fats in these plants is doubtless also important, since it accounts for the thickness of their cuticle and for several features of internal structure. It may explain also their slow growth. Since the presence of fatty acids is associated with the possibility of splitting off carbon dioxide in the absence of oxygen, we may account for the fact that these plants live in soils which are often deficient in oxygen.

It is curious that a similar group of factors seems to be operating in the case of the unicellular free floating algae (plankton) for fresh water lakes. Generally speaking, those algae which produce much fat (e.g., Diatoms, *Ceratium hirundinella*) are characteristic of calcareous water (basic ratio low). In fresh waters with a high basic ratio, green algae, producing chiefly starch, are predominant. While most Desmids belong to this latter group—a few produce

abundant fat, and these, as far as my observations go, are characteristic of calcareous water.

In the case of the Diatoms and *Ceratium*—calcium salts in the external solution seem to be necessary in order to form the fat impregnated walls (of insoluble calcium soaps) found in these organisms. The scarcity of fats in the algae of waters containing principally potassium and sodium may be due to the loss of these fats as soluble potassium and sodium soaps by diffusion into the water. The calcareous lakes are usually characterised by a deficiency of oxygen in their deeper layers, and the presence of fats in the Diatoms and *Ceratium* (which pass at least part of their existence in these deeper layers) seems to imply, as in the case of the peat plants, the possibility of respiration without oxygen.

When growing plankton algae in dilute culture solutions, it was found that the solutions containing a high basic ratio apparently prevented not only the predominance of diatoms, but also largely inhibited the growth of fungi. If generally the case, this might explain the scarcity of fungi in sour soils, and since the fungi are responsible for the decay of organic matter, it would lead indirectly to the accumulation of peat in such soils. The observation might help to explain not only the antiseptic properties of these soils, but also the fact that organic matter decays very slowly in waters containing high basic ratios. Certainly in the English lakes, with waters of this type, little fungal and bacterial action exists in deep water, and consequently oxygen is not used up—and the deeper waters remain well aerated. In these lakes where the waters have a low basic ratio there is abundant organic decomposition in deep water, the dissolved oxygen is used up, and the carbon dioxide freed causes these deeper waters to become acid. These changes affect not only the phytoplankton, but also the fishes and other animals inhabiting such a lake.

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According to the press, Mr. H. D. Roberts, of Brighton, states that the importance of Natural History is now recognised in the schools and other institutions throughout the country!

'Bacteria' is the main theme in Part 16 of *The Outline of Science*. It is written by Sir E. Ray Lankester, 'the greatest living zoologist . . . the Achilles of Darwin,' a coloured portrait of whom appears in the part and also on the cover.

We learn from the fourth annual report of the Gilbert White Fellowship that there are now 324 members. 'The Gilbert White Memorial Fund makes but slow progress. During the year the subscriptions received have been few, and the total fund, after the deduction of expenses, stands at less than £30.'

The second edition of 'A Handbook to the Collections illustrating a Survey of the Animal Kingdom' has been issued by The Horniman Museum (66 pp., 6d.). It contains a detailed account of the natural history specimens in the collections and an appendix on 'Hints on the Study of Zoology.'

SCARCITY OF CORN BUNTING IN THE WILSDEN DISTRICT.

THE Corn Bunting, which was never an abundant species in this district, but was not uncommon locally thirty years ago, has recently become quite a scarce breeding species, and I have often wondered whether in any other part or parts of its breeding range in Britain similar remarks are applicable. As far as this district is concerned, I have invariably found their nests in open meadow field—never in corn fields—and within comparatively recent years there has grown up a tendency among farmers to cut the grass somewhat earlier, which must have destroyed many nests. This fact may, to some extent, account for its partial disappearance, but in these circumstances, one would suppose they would attempt a second nest. In some districts the nest is usually found in furze bushes, two feet from the ground; but I have never found its nest except on the ground—never even in a pasture. It is alleged by some not to commence nesting before early July, even further south than Yorkshire, but this is much too sweeping a statement. In average years in this part it used to nest in May. Many ornithologists state the number of eggs, four to six—three to four—seldom five, in my experience, would be nearer the facts. It always seems that this species much prefers the flatter and more cultivated parts of the country, specially in the neighbourhood of the sea, than the mountainous and more bleak parts of the country.—E. P. BUTTERFIELD.

In Yorkshire the Corn Bunting may be considered essentially a bird of the coast-line, for, although it occurs in various inland localities, it is not abundant in any of them. Twenty years ago there were always a few pairs in the Harrogate district, but they have now entirely deserted the locality. I have always considered the Corn Bunting to be more or less double-brooded, as I find the nests from May to the end of September. In the Spurn district, where the birds are plentiful, I have frequently found the nest with fresh eggs in the latter month, and in common with Mr. Butterfield, my experience is that three to four constitutes the usual number of a clutch, the smaller number more frequently than the larger.—R.F.

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The Manchester Art Gallery Committee, in its Annual Report for 1921, has illustrated many of the gems of the Lloyd Roberts bequest to the Corporation.

Conquest for July contains a well illustrated article on 'The Prince of Wales's Collection at the Zoological Gardens,' by R. I. Pocock, and one on 'How I Filmed the Cuckoo,' by Edgar Chance, though the latter subject is now getting a little bit out of date.

NOTES ON SPECIMENS OF CEPHALOPODA
FIGURED IN TATE AND BLAKE'S
'YORKSHIRE LIAS,' 1876.

BY THE LATE GEORGE C. CRICK, A.R.S.M., F.G.S.

AT the end (p. xii.) of the 'Explanation of the Plates,' in Tate and Blake's 'Yorkshire Lias,' 1876, occurs the following note:—'The greater number of fossils figured in these plates, where not otherwise specified, are in the Museum of Practical Geology, Jermyn Street.' In carefully working through the J. F. Blake collection acquired by the Trustees of the British Museum, one was therefore somewhat surprised to find in that collection a number of the Cephalopoda which were figured in that work. The following notes relate to the identification of these specimens.

The systematic position of the figured examples is not discussed here.

AMMONITIDÆ (p. 261).

Ægoceras planorbis J. de C. Sowerby sp. (p. 270).

Blake observes (p. 270): 'The flattened specimens obtained from the clays of Cliff agree with Sowerby's type, as do those in the Eston gypsum pit, but the more perfect specimens, which are obtained from blocks of limestones washed up by the sea, and which have long been known under the local name of *A. erugatus*, are a little less involute.' The Blake collection includes a flattened, obscure specimen about 43 mm. in diameter exposed on the surface of a piece of clay [B.M. No. C. 19209] and unfortunately is unaccompanied by any information. Though flattened like the Watchet specimens, it is of a brownish colour and exhibits no iridescence. It is possible that this is an example of the species from the clays of Cliff. The collection contains also a sub-triangular fragment (about 90 mm. by 75 mm.) of a water-worn block of limestone, such as is mentioned by Blake, exhibiting on its fractured surfaces a number of examples of '*Ammonites erugatus*' [B.M. No. C. 19176-82], the largest example having a diameter of about 42 mm. Unfortunately the fragment is not localised. Blake states:—'Two varieties are found in Yorkshire and elsewhere (corresponding to the *A. psilonotus lævis* and *A. p. plicatus*, of Quenstedt), one smooth and the other with light bent ribs.' Both forms appear to be represented in the block. There is also in the collection a detached example of the species, 31 mm. in diameter, that has been mesially sectioned, but it is not localised [B.M. No. C. 19175].

Ægoceras johnstoni J. de C. Sowerby sp. (p. 271).

The Blake collection contains no specimen so labelled.

Ægoceras angulatum Schlotheim sp. (p. 271).

Blake did not figure any example of this species. He states:—'There are two varieties: (a) most involute, the outer whorl being more than $\frac{1}{3}$ the diameter—the common Redcar fossil; (b) less involute, with outer whorl $\frac{1}{4}$ the diameter, occurring chiefly in the southern area.' His collection contains an example 45.7 mm. in diameter [B.M. No. C. 18110], labelled in his own handwriting: 'A angulatus, Redcar'; also another smaller specimen 50.5 mm. in diameter [B.M. No. C. 18111], not labelled, but appearing from its matrix to come from the same locality.

The species *Ammonites aequalis* was described by M. Simpson (Foss. Yorkshire Lias, 1855, p. 49) as follows:—'Outer whorl nearly $\frac{1}{3}$ the diameter, inner margin prominent; radii equal, bend towards the aperture on the outer part of the whorl, nearly obsolete on the middle of the back, not equal to the intervening spaces; aperture ovate; diameter, $1\frac{1}{2}$ in. A cast with the centre broken; probably from the lower lias.—Mr. Ripley's Col.'

In the second edition of his work (published in 1884) Simpson (pp. 80-81) transcribes his previous description, merely omitting the words 'Mr. Ripley's Col.'

Blake, who regarded this species as *Ægoceras angulatum* (Schlothheim), observes (Tate & Blake, 'Yorkshire Lias,' 1876, p. 271): 'The *A. aequalis* of Simpson is a peculiar form of the latter variety appearing from its matrix to come to [*sic*] slightly higher beds than usual, but it is only a fragment.' It would appear, therefore, from this statement about the matrix that Blake had seen the type-specimen.

In the Blake collection there is a fragment of an ammonite [B.M. No. C. 18109], the internal cast of half of the outer whorl, 1.65 in. in diameter, with only traces of the inner whorls in the fractured surface filling the umbilicus, labelled in, what is believed to be, Simpson's handwriting: 'A. aequalis. Lias. Yorks., 110.' There is, therefore, great probability that this is the holotype of Simpson's species that was originally in the collection of Mr. Ripley. Its exact locality in Yorkshire is unrecorded.

Ægoceras charmassei d'Orbigny sp. (p. 272).

There is no example of this species in the Blake collection.

Ægoceras nanum? Martin sp. (p. 272).

Blake (p. 272) writes: 'A minute single specimen ($\frac{1}{4}$ inch), from the *A. angulatus*—beds of Cliff, I cannot identify as the young of any known form, it has very similar characters to the small shell described by Martin, and quoted above [1860. 'Paléontologie Stratigraphique de l'Infralias,' pl. i., figs. 3-5]. There are no ribs but swellings or knobs rather nearer the inner edge, and the front is smooth and round. In *Æ. nanum* the knobs are on the outside, and the back is flatter.' This specimen is in the Blake collection [B.M. No. C. 17938] and is represented in Blake's Pl. V., fig. 1., the outline figure indicating the natural size. The specimen was in a small round glass-topped box labelled in Blake's handwriting: 'Ammonites nanus? Fig. 1. Am.' The name on the box originally read: 'Ammonites angulatus (Schl.) (young)!' but the words 'angulatus' and ' (young) ' have been crossed out, and the name 'nanus'? inserted. Attached to the box was also another label in Blake's handwriting: 'Pl. A., fig. 1' The specimen is not accompanied by any locality label, but fortunately the 'Geological position' is given by Blake—*A. angulatus*—beds of Cliff.

Ægoceras longipontium Oppel sp. (p. 273).

The Blake collection does not contain an example of this species.

Ægoceras pauli Dumortier sp. (p. 273).

The small block represented in Blake's figure 4A is in the Blake collection and includes two specimens [B.M. Nos. C. 17934 and C. 17935]. The block, represented in Blake's figure of about the natural size, is labelled in Blake's handwriting: 'Pl. B., fig. 4.' and '[Buckla]ndi. [Red]car. [A. se]micostatus A. Pauli,' but the second label has been very much damaged. Referring to this species Blake remarks: 'It is represented by the lower specimen [B. M. No. C. 17934] of the two on the same stone,' and for the 'Geological position' he gives: 'Zone of

A. Bucklandi, Redcar (1 ex. with *Arietites semicostatus*.) The periphery of the specimen is represented in Blake's fig. 4B.

Ægoceras pellati Dumortier sp. (p. 273).

The fragment attributed to this species and figured in Pl. VI., fig. 5, is in the Blake collection [B.M. No. C. 17880]. The specimen is represented of about the natural size. It is labelled in Blake's handwriting: 'Bucklandi, Redcar, Am. Pellati, Pl. B., fig. 5,' the words 'cf. *vellicatus*,' having been crossed out and the word 'Pellati' substituted. The 'Geological position' given by Blake is: 'Zone of *A. Bucklandi*, Redcar (2 ex.).'

Ægoceras (?) *finitimum*, n. sp. (p. 273).

Blake states: 'I have only seen two examples of this in the Leckenby collection under the name *finitimum*, Bean MS., which I have adopted. The Blake collection does not contain an example of the species.'

Ægoceras (?) *viticola* Dumortier sp. (p. 274).

Blake's remark is: 'A single example in the Leckenby collection.' Blake's collection does not include an example.

Ægoceras nigrum Blake (p. 274).

The Blake collection [B.M. No. C. 17889] contains the holotype of this species. It is labelled in Blake's handwriting: 'Pl. B., fig. 6,' the figure being of about the natural size. The specimen bears no locality label, but the 'Geological position' of the species given by Blake is only: 'Zone of *A. bucklandi*, Robin Hood's Bay. With *Æg. birchii* (4 exs.).' This, therefore, must be the horizon and locality of the type. His collection includes another example [B.M. No. C. 17890], 19.5 mm. in diameter, labelled in Blake's handwriting; 'Am. niger R.H.B.'

Ægoceras birchii J. Sowerby sp. (p. 274).

Blake records this species from Redcar and Robin Hood's Bay, in Yorkshire, but his collection does not include a Yorkshire example of the species.

Ægoceras scoresbyi Simpson sp. (p. 275).

To this species Blake refers one example in the Whitby Museum. His own collection does not include an example.

Ægoceras planicosta J. Sowerby sp. (p. 275).

Of the Yorkshire examples of this species in the Blake collection only two are localised. One [Brit. Mus. No. C. 19187], a small specimen, 16.2 mm. in diameter, is labelled in Blake's handwriting: 'Am. planic. Peak.' Blake does not mention this locality for the species unless the term 'Robin Hood's Bay' includes its southern boundary, 'Peak.'

The other example [Brit. Mus. No. C. 19186], an ammonite 32 mm. in diameter, is labelled in Blake's handwriting: 'oxynotus. R. H. Bay. *A. ziphus*.' This is doubtless the form which Blake alludes to in his remarks, which are as follows: 'In some the outer whorls develop great tubercles, while the inner whorls are of the typical form . . . When thus developed we have the *A. ziphus* of Zieten . . .'

Ægoceras gagateum G. Young and J. Bird sp. (p. 275).

The Blake collection includes the original of his Pl. VI., fig. 8 [B.M. No. C. 17883]. It is fairly well represented, of about the natural size, in Blake's figure. It is labelled in Blake's handwriting: 'Pl. B., fig. 8.' The 'Geological position' of the species given by Blake is: 'Zone of *A. oxynotus*, of which it is highly characteristic. Robin

Hood's Bay, Warter and Market Weighton.' As the specimen bears no locality label, its 'Geological position' is somewhat uncertain, but it is highly probable that it came from the 'zone of *A. oxynotus*,' Robin Hood's Bay, of which zone, as Blake states, it is highly characteristic. The collection also includes six examples [B.M. Nos. C. 17884-8 and C. 19191] ranging in diameter from 34.4 mm. to 17.6 mm. [C. 17884, 34.4 mm.; C. 17885, 30 mm.; C. 17886, 25.2 mm.; C. 17887, 23.3 mm.; C. 17888, 19.0 mm.; C. 19191, 17.6 mm.], each labelled in Blake's handwriting as *Ammonites gagateus* from Robin Hood's Bay, but the horizon is not given in any single instance. There are other examples in his collection but these are not localised.

Ægoceras sagittarium Blake (p. 276).

Blake states (p. 276) that 'the description and figure are taken from a specimen in the Cambridge Museum.' This statement can only apply to fig. 2A, as the original of fig. 2B is in the Blake collection [B.M. No. C. 17881]. It is a mere fragment of which only a portion is depicted and reduced (as shown by the thickness of the whorl) in Blake's fig. 2B, but it is labelled in Blake's handwriting: 'Pl. C., fig. 2B.' It is without a locality label, but as Blake (p. 276) only gives for the 'Geological position' of the species: 'Zone of *A. oxynotus* (base), Robin Hood's Bay,' this may be safely regarded as the 'Geological position' of the figured specimens. The whole specimen consists of about one-third of a whorl from the base of the body-chamber forwards; the length along the median line of the periphery being about 96 mm.

The Blake collection contains another specimen [B.M. No. C. 18040] of about 145 mm. in diameter, consisting of a little more than a single whorl, the inner whorls being entirely wanting. It is labelled in Blake's handwriting: '*Ammonites sagittarius* R. Hood's Bay.'

Ægoceras (?) *raricostatum* Zieten, (p. 276).

About this species Blake only states: 'The young forms are somewhat like the young of the next [*Ægoceras obsoletum* Simpson sp.], but differ by a slight appearance of a keel. I have not seen the *A. exortus* of Simpson, but its description would lead to its identification with this.

'Geological position.—Zone of *A. oxynotus* (top), Robin Hood's Bay in hard nodules.'

One specimen in Blake's collection [B.M. No. C. 19195], 72.2 mm. in diameter, is labelled in Blake's handwriting: '*A. raricostat* R. Hood's Bay.' It is somewhat distorted, its whorls being unsymmetrically coiled, a form of distortion not infrequent in this species. The other specimens in the collection are from Peak. Of these, the largest [B.M. No. C. 19200], 63.2 mm. in diameter, and labelled in Blake's handwriting: '*Ammon. raricostatus* Peak,' is also unsymmetrically coiled. A smaller specimen [B.M. No. C. 19197], 53.5 mm. in diameter, in a rock fragment labelled in the same handwriting: '*Am. raricostatus* Peak,' is associated with two young specimens [B.M. Nos. C. 19198 and C. 19199], 16 and 18.5 mm. in diameter respectively, each, especially the larger one, [No. C. 19199], exhibiting the slight appearance of a keel mentioned by Blake. Another example [B.M. No. C. 19196], 33 mm. in diameter is labelled in Blake's handwriting: '*A. raricost.* Peak, Way Ft.' It would seem then that in this case and in others relating to Middle and Lower Liassic forms, the expression 'Robin Hood's Bay' may include Peak at the southern end of the Bay. Or the specimens from Peak may have been obtained subsequent to the publication, or at any rate, the writing of Prof. Blake's observations.

Ægoceras obsoletum Simpson sp. (p. 276, pl. VII., figs. 1A, B).

A specimen in the Blake collection [B.M. No. C. 17939] is obviously

the original of his Pl. VII., figs. 1A, 1B, although it bears no label or any marks whatever. The displaced position of the anterior part of the specimen—the displaced portion being the base of the body-chamber—serves at once to identify the fossil, although an obvious irregularity in the curvature of the whorls is not indicated. The figure is reduced; the greatest diameter of the fossil, that is at the extremity of the septated portion, being 58.4 mm. Respecting the 'Geological position' of the species Blake writes: 'Zone of *A. oxynotus*. In almost every nodule of a certain band in the upper part of the zone at Robin Hood's Bay, Londesborough.' From this statement it is clear that the fossil come from the zone of *A. oxynotus*, and it seems fairly safe to conclude that it was from Robin Hood's Bay. It is accompanied by a loose label (which cannot now be fitted on to the specimen) on which is written: 'Pl. C, fig. 1.'

There is, in the Blake collection, a small rock-fragment containing two individuals. The fragment [B.M. No. C. 18123] is labelled in Blake's handwriting: 'A subplanicosta. L. Lias. R. Hood B.' Another fragment [B.M. No. C. 19207], containing a specimen 24 mm. in diameter, is labelled in Blake's handwriting: 'Am. subplanic. L.L. R.H.B.' These specimens appear to be what Blake regarded (p. 277) as the young of Simpson's *Ammonites obsoletus*.

Ægoceras armatum J. Sowerby sp. (p. 277).

The 'Geological position' given by Blake for this species is: 'Sub-zone of *A. armatus* (characteristic), Robin Hood's Bay, Warter, High Stones Redcar.' His collection contains a number of *armatus*-like specimens but only two are localised. One of these [B.M. No. C. 19219], about 140 mm. in diameter, is labelled in Blake's handwriting: '[Amm]onites [arm]atus [R.] Hood's Bay.' This seems to be referable to Simpson's species *A. miles*. The other localised specimen [B.M. No. C. 19220] is an example 77 mm. in diameter, labelled in Blake's handwriting: 'Am. armatus Peak.' As has already been stated in dealing with *Ægoceras* (?) *varicostatum*, the expression 'Robin Hood's Bay,' given in the 'Geological position' of the species, would seem to include Peak at the southern end of the Bay. The collection includes a specimen [B.M. No. C. 19218], 19 mm. in diameter, unlocalised, but labelled in Blake's handwriting: 'Amm. owenensis L. Lias?' Blake regarded this species of Simpson's as the young of Sowerby's *armatus*.

Ægoceras aculeatum Simpson sp. (p. 278).

The original of Blake's Pl. VII., fig. 4 is in the Blake collection [B.M. No. C. 17878], the various fractures indicated in Blake's figure rendering the identification of the specimen absolutely certain. Blake's figure is reduced, the greatest diameter of the fossil being 104 mm. The specimen is labelled in Blake's handwriting: 'Pl. C., fig 4.' It bears no locality label, but since for the 'Geological position' of the species Blake merely states: 'Sub-zone of *A. armatus*, Robin Hood's Bay,' this must be the horizon and locality of the figured example. The species is probably also represented by an unnamed specimen [B.M. No. C. 18066], 92.4 mm. in diameter, marked in Blake's handwriting: 'A. Base of M.L. R.H.B.' [*i.e.*, Base of Middle Lias, Robin Hood's Bay].

The Blake collection includes a specimen [B.M. No. C. 19221], 64.2 mm. in diameter, labelled in Blake's handwriting: 'Am. decussatus M.L. R.H.B.' Blake regarded this species of Simpson's as a synonym of the same author's *aculeatus*.

Another specimen in the same collection [B.M. No. C. 19222], without any label whatever, may be either an example of Simpson's *retusus*, which Blake regarded as a synonym of the same author's *aculeatus*, or of an allied species.

Again the Blake collection contains a specimen [B.M. No. C. 18065], 75.7 mm. in diameter, labelled in his handwriting: 'A. mutatus. M. Lias. Peak.' Blake places Simpson's *A. mutatus* with a ? in the synonymy of Simpson's *aculeatus*, and in his observations on the latter species writes: 'The *A. mutatus* of Simpson I have not seen, but I think, by its description, it must belong here.' It would seem therefore that this specimen came into Blake's possession after the publication, or at any rate the writing, of his remarks on Simpson's species *aculeatum*, and this may account for Peak not being mentioned in the 'Geological position' of the species as given by Blake.

Ægoceras validum Simpson sp. (p. 278).

No example of this species has been recognised in the Blake collection.

Ægoceras sociale Simpson sp. (p. 278).

No example of this species has been recognised in the Blake collection.

Ægoceras tubellum Simpson sp. (p. 278).

No example of this species has been recognised in the Blake collection.

Ægoceras taylori J. de C. Sowerby sp. (p. 279).

Respecting this species, Blake states: 'The two varieties of this rare shell which Quenstedt indicates by the names *nodosus* and *costatus* are very dissimilar, and their scarcity in Yorkshire would have prevented their being united; but as they occur together, and the most tuberculated form is seen itself to vary in the number of tubercles, as noticed by Simpson and marked by his two names [*cornutus* and *quadricornutus*], we are not in a position to overrule the dictum of foreign geologists, that they must be considered one species. We may, however, designate the less tuberculated form as var. *lamellosum*, the presence of which does not seem to have been noticed, or it would certainly have received a name.'

A specimen in the Blake collection [B.M. No. C. 17981], about 53 mm. in diameter (excl. the spines), is labelled in Blake's handwriting: 'A. Taylori, base of M.L. R. Hood's B.' It is strongly tuberculated, there being twelve tubercles in each row in the outer whorl. The same collection includes a more definitely costate and less tuberculate form [B.M. No. C. 17982], labelled in Blake's handwriting: 'Am. cornutus; base M.L. R.H.B.' [*i.e.*, base of the Middle Lias, Robin Hood's Bay]. This may be the less tuberculate form which Blake proposed to designate as var. *lamellosum*, 'the presence of which,' he states, 'does not seem to have been noticed, or it would certainly have received a name.'

The 'Geological position' of the species is given as: 'Sub-zone of *A. armatus*, Robin Hood's Bay.'

Ægoceras jamesoni J. de C. Sowerby sp. (p. 279).

The Blake collection does not contain any Yorkshire examples of this species.

Ægoceras brevispinum J. de C. Sowerby sp. (p. 280).

Yorkshire examples of this species have not been recognised in the Blake collection.

Ægoceras regnardi d'Orbigny sp. (p. 280).

Yorkshire examples of this species have not been recognised in the Blake collection.

Ægoceras heberti Oppel sp. (p. 280).

This species is not represented in the Blake collection. Blake states: 'The only example I have seen is in the York Museum, and agrees perfectly with d'Orbigny's figure.' As to the 'Geological position,' Blake states: 'Unknown, but probably sub-zone of *A. armatus*.'

Ægoceras grenouillouxi d'Orbigny sp. (p. 280).

Although there are no examples in the Blake collection definitely referred to this species, there are two pyritised specimens which Blake may have regarded as belonging to d'Orbigny's species. One of these [B.M. No. C. 19223], the smaller of the two, 21.2 mm. in diameter, is labelled in Blake's handwriting: 'Am. beds, R.H.B.' The peripheral portion of the outer whorl is well shown, also the umbilical margin on one side, but the umbilicus is obscured on each side by matrix. At its greatest diameter the whorl is 10 mm. wide, and in the last half whorl there are 15 transversely-elongated tubercles. The larger example [B.M. No. C. 19224] is 38.6 mm. in diameter, but the last portion of its outer whorl is abnormally inflated, possibly owing to pyrites; at the diameter of 31 mm. the thickness of the whorl is 12.4 mm. and in the last half-whorl at this diameter the lateral area bears 15 transversely elongated nodes and about three intermediate ribs, which do not bear tubercles. The specimen bears no original label, but its matrix and mode of preservation are precisely similar to those of the smaller specimens.

The 'Geological position' of the Yorkshire representatives of this species is given by Blake as: 'Zone of *A. jamesoni*, Robin Hood's Bay.'

Ægoceras striatum Reinecke sp. (p. 281).

The Blake collection contains a Yorkshire ammonite [B.M. No. C. 18117] answering to Blake's description of this species. It is a coarsely ornamented form, 70 mm. in diameter, labelled in Blake's handwriting: 'A. henleyi, R. Hood's B.,' but it does not agree with Blake's interpretation of that species.

Ægoceras henleyi J. Sowerby sp. (p. 281).

In the Blake collection there is an ammonite [B.M. No. C. 18118], 97 mm. in diameter, answering to Blake's description of this species. The specimen is not localised, but the matrix of the fossil and its mode of preservation, would, on comparison with the specimen above referred to *Ægoc. striatum* [B.M. No. C. 18117], lead one to suppose that the two fossils came from the same locality and horizon. Blake, however, gives for the 'Geological position' of *Ægoceras striatum*: 'Zone of *A. jamesoni* (rare at the top), Robin Hood's Bay, Rockcliff, Huntcliff,' and for that of *Ægoceras henleyi*: 'Zone of *A. capricornus*, Huntcliff, Robin Hood's Bay.' The 'Geological position' then of the fossil is uncertain.

Ægoceras bechei J. Sowerby sp. (p. 281).

The Blake collection does not include a Yorkshire example of this species.

Ægoceras capricornum Schlotheim sp. (p. 281).

Respecting this species, Blake states: 'This is a rather variable species in respect to the strength of its ribs, which in some grow to an enormous size, so as to double the section of the whorl taken through them, and pass quite straight over the front; in others they are depressed on the front and grow rather oblique.' The Blake collection contains a specimen [B.M. No. C. 19225], labelled in his handwriting: 'A. capricornus, R. Hoods B.,' having exceedingly strong ribs, as described by Blake. It is 58 mm. in diameter, its thickness through the ribs being 25 mm., and between the ribs 19.5 mm. The collection includes also another fossil [B.M. No. C. 19226], the diameter of which is 56 mm.; its thickness, through the ribs 17 mm., and between the ribs 14.2 mm., having its ribbing rather oblique. The specimen is not localised, but its matrix and mode of conservation are the same as the strongly-ribbed form already mentioned.

There is a specimen [B.M. No. C. 18064] in the Blake collection, 4

inches in diameter and labelled in Blake's handwriting: "Am. capricornus, Whitby," that may be the specimen mentioned by Blake as 'certainly the adult of *Æg. capricornum*.'

The Blake collection also contains three specimens each named *Am. arcigerens*. One of these [B.M. No. C. 18061], 25.2 mm. in diameter, and labelled in Blake's handwriting: 'Am. arcigerens Peak,' exhibits the angular deflection [of the ribs] on the front, referred to by Blake, and would probably therefore have been included by Blake in *Ægoceras defossum* Simpson. Another specimen [B.M. No. C. 18062], 24 mm. in diameter, and labelled in Blake's handwriting: 'Am. arcigerens, R. Hood's B. '; and a third [B.M. No. C. 19227], 18.5 mm. in diameter, and labelled in Blake's handwriting: 'Am. arcigerens, M. Lias. Peak,' were probably referred by Blake to *Ægoceras capricornum*, Schlotheim sp. The collection contains also three other specimens, 22 mm., 19 mm., and 12 mm. in diameter respectively not labelled, of which, one, the medium-sized specimen exhibits the forward angular deflection of the ribs, observable in Simpson's species *defossum* and *omissus*, species which are referred by Mr. Buckman to the genus *Oistoceras*.

Ægoceras defossum Simpson sp. (p. 282).

An unlabelled specimen in the Blake collection [B.M. No. C. 17988] is clearly the original of Blake's Pl. VIII., fig. 9, the imperfection of the anterior part of the fossil being well represented in the figure, which depicts the fossil of about the natural size. It was in a small tray with three other specimens,* one [B.M. No. C. 18062], labelled 'Am. arcigerens, R. Hood's B. '; another [B.M. No. C. 18061] labelled 'Am. arcigerens Peak'; whilst the third [B.M. No. C. 18063] is without any information. Since the 'Geological position' of the species given by Blake is: 'Zone of *A. capricornus*, Staithes, Hautcliff [probably a typographical error for 'Huntcliff], Robin Hood's Bay,' the locality of the figured example is uncertain. It is, however, to be observed that its matrix agrees fairly well with that of the example from Peak [B.M. No. C. 18061]: Buckman (Yorkshire Type Ammonites, part III., 1911, 27) refers Blake's figured example to Simpson's *Ammonites omissus* and places it in the genus *Oistoceras*. Blake's collection contains another example of the same species [B.M. No. C. 19231], 33 mm. in diameter, but this is unlabelled.

Ægoceras diversum Simpson sp. (p. 282).

It would seem from Blake's remarks that he only saw two examples of this species; one he figured (Pl. VIII., fig. 3). His description seems to be based upon Simpson's type-specimen. We have not recognised an example of the species in the Blake collection.

Ægoceras sinuatum Simpson sp. (p. 283).

Blake merely quotes Simpson's description of this species and adds: 'A specimen in the Whitby Museum agrees well with the description, and I cannot identify it with any other form.' By stating (in brackets) at the end of the description '1 ex.,' it would appear that Blake saw only this one example, at any rate, the species does not appear to be represented in his collection.

Arietites bucklandi J. Sowerby sp. (p. 283).

The Blake collection neither includes the figured specimen (Pl. V., fig. 2), nor any example of the species either named by Blake, or that can be referred to this species as defined by Blake. He writes of this species as a 'characteristic, though rare, shell in Yorkshire,' and states that it 'is [in Yorkshire] only found, to our knowledge, at Redcar, where

* See ante under *Ægoceras capricornum*.

it is not common, but grows to a diameter of 8 to 10 inches.' Its *Geological position* is stated to be 'In the limestone of the series to which it gives its name, Redcar.'

Arietites bisulcatus Bruguière sp. (p. 283).

Respecting this species Blake writes: 'I keep this name for those forms that present a square front, almost transverse, with straight ribs tuberculated outside,' and for the *Geological position* gives: 'Zone of *A. Bucklandi*, Redcar, Robin Hood's Bay.' The Blake collection contains an example [B.M. C. 19649], 22 mm. in diameter, labelled in his handwriting: 'Buckl. Redcar, Ammonites bisulcatus,' the word 'Buckl.' evidently meaning 'Zone of *A. Bucklandi*.'

Arietites multicostatus J. de C. Sowerby sp. (p. 284).

Respecting this species Blake writes: 'I have only seen two specimens in the Leckenby Collection and an imperfect one from Redcar, that I refer to this species;' and for the '*Geological position*' he gives: 'Zone of *A. Bucklandi*, Redcar, and in boulders,' but there is now no specimen in the Blake collection that appears to be referable to this species.

Arietites obesulus spec. nov. (p. 284, Pl. VI., fig. 2).

Blake writes: 'This species is founded on specimens in the Leckenby Collection labelled *A. nodulosus* (Young and Bird), but as Young and Bird's species of that name is a young form of *A. margaritatus*, and the name has been used for another form from Cheltenham, a new name is required. It is quoted in our Part I. as *A. nodulosus*.' He gives its '*Geological position*' as: 'Probably zone of *A. Bucklandi*, Robin Hood's Bay.' The Blake collection does not contain any example that appears to be referable to this species.

Arietites brooki J. Sowerby sp. (p. 284).

Without any other remarks Blake simply writes: '*Geological position*.—Zone of *A. Bucklandi*, Redcar, Robin Hood's Bay (Simpson).' In the Blake collection there is no specimen which has been marked as belonging to this species.

Arietites conybeari J. Sowerby sp. (p. 284, Pl. VI., fig. 1).

The figured specimen has not been recognised in the Blake collection, but the collection includes an ammonite [B.M. C. 19650], 118 mm. in diameter, labelled in Blake's handwriting: 'Bucklandi. Redcar, Ammonites conybeari.'

Arietites spiratissimus Quenstedt sp. (p. 285).

There is no example so labelled in the Blake collection.

Arietites tardecrescens Hauer sp. (p. 285).

A specimen in the Blake collection [B.M. No. C. 17879] is labelled in Blake's handwriting: 'Pl. A., fig. 5,' and probably formed the basis of Blake's figure, but the latter has been restored and reduced, the greatest diameter of the original being 76.5 mm. It had no locality label, but Blake remarks about the species (p. 285): 'It is very characteristic of the lowest beds of the Middle Lias, just at the base of the village of Robin Hood's Bay, for which reason it is figured.' Since the only horizon and locality for this species given by Blake is: 'Sub-zone of *A. armatus*, Robin Hood's Bay,' this may with safety be regarded as the horizon and locality of the fossil. Although figs. 5 and 5B. are connected by a dotted line, the two figures are not necessarily drawn from the same example, as evidenced also by other figures, e.g., Pl. VI., figs. 2A, 2B (*Aegoceras sagittarium*), the original of fig. 2 being merely a

fragment. (See *infra*, p. 276). Indeed, fig. 5B does not represent the periphery of the specimen under consideration, for in this fossil the periphery is a little asymmetrical, and one side of the specimen is attached to matrix so that the exact width of the whorl cannot be seen. Another somewhat smaller example (about 60 mm. in diameter) in the same collection [B.M. No. C. 17898], and labelled in Blake's handwriting 'Ammonites tardecrescens, base of M.L. Robin H. Bay,' has the periphery not only symmetrical but much better preserved. This, then, may have formed the basis of Blake's figure 5B.

Besides these examples there are other specimens in the Blake collection. One [B.M. No. C. 19655], exposed on the surface of a split nodule and about 90 mm. in diameter, is labelled in Blake's handwriting: 'A. tardecrescens, base of M.L. R. Hood's B.,' whilst a small specimen [B.M. No. C. 19656], 21 mm. in diameter, is labelled in the same handwriting: 'Armatus, R.H.B., Ammonites [tar] decrescens.' Another specimen, 17.6 mm. in diameter [B.M. No. C. 19657] is unlabelled, but appears, judging from its lithological characters, to have come from the same horizon and locality. Further, a broken nodule, which, judging from the matrix, is apparently from the same horizon and locality as No. C. 19655, exhibits three specimens [B.M. Nos. C. 19658, C. 19659, C. 19660], the largest about 23 mm. in diameter. It was doubtless such forms as these which Blake had before him when he wrote: 'A small form is common in the same beds, which may be the young of this—it is the *A. aureolus* of Simpson.'

Arietites caprotinus d'Orbigny sp. (p. 286).

Blake mentions one example from the 'Zone of *A. oxynotus*, Peak,' but there is now in the Blake collection no specimen either so labelled or comparable with D'Orbigny's figures (Pal. Franc. Terr. jur. I., Pl. 64, figs. 1, 2).

Arietites sphioides d'Orbigny sp. (p. 286).

In his remarks on this species Blake refers to five specimens from 'Probably zone of *A. oxynotus*, Robin Hood's Bay,' but the Blake collection does not contain a specimen either thus labelled, or that agrees with D'Orbigny's figures (Pal. Franc., Terr. jur., I., Pl. 64, figs. 3-5).

Arietites spinaries Quenstedt sp. (p. 286).

Of this species, Blake records 'fragments; one good specimen in York Museum' from the 'Zone of *A. Bucklandi*, Robin Hood's Bay,' but the Blake collection now contains no example bearing this name.

Arietites rotiformis J. de C. Sowerby sp. (p. 286).

Blake states that 'A fine specimen of this species, which differs from *A. bisulcatus* in having narrower whorls, and from *A. multicostratus* in having tubercles on the outer side, in the Leckenby Collection is the authority for inserting it in the list,' giving for the 'Geological position' of the species: 'Probably zone of *A. Bucklandi* (1 ex.).' There is now in the Blake collection no example marked as referable to this species.

Arietites turneri J. de C. Sowerby sp. (p. 286).

Blake states that 'With this species are identified some of the very large Ammonites found on the lowest scars at Robin Hood's Bay. In extreme age they are not easily distinguished from *A. stellaris*; in the latter the whorls grow narrower, in this broader.' The Blake collection now contains no specimen which has been identified with this species, the 'Geological position' of which Blake gives as: 'Zone of *A. Bucklandi* (upper part). Redcar, Robin Hood's Bay.'

Arietites sinemuriensis d'Orbigny sp. (p. 287).

Respecting this species Blake merely states: 'Similar to *A. bisulcatus*

but with the ribs joining towards the outside by cross bars.' He gives as its '*Geological position*': 'Zone of *A. Bucklandi*, Marske.' The Blake collection now includes no specimen which has been or can be identified with this species.

Arietites stellaris J. Sowerby sp. (p. 287).

Blake states than in Yorkshire 'good examples of this species are not common,' and that 'they range from $\frac{1}{2}$ an inch to a foot in diameter.' The Blake collection includes a specimen [B.M. No. C. 19990], 36 mm. (or rather more than $1\frac{3}{8}$ inches) in diameter, labelled in Blake's handwriting: '*A. stellaris*, 56 R. Hood's B.' As the '*Geological position*' of the species Blake gives: 'Zone of *A. oxynotus* (base), Robin Hood's Bay, Marske (boulders).'

Arietites obtusus J. Sowerby sp. (p. 287).

Respecting this species Blake merely states: 'This may be taken as the final step of *Arietites* towards *Egoceras* in one direction, the similarity between it and *Eg. sagittarium* being great.' As the '*Geological position*' he gives: 'Zone of *A. oxynotus*. Common at Robin Hood's Bay at the base of the series, and not growing to a large size.' The Blake collection includes two examples each labelled in Blake's handwriting: '*A. obtusus*, R. Hood's B.' The larger example [B.M. No. C. 19991] is about 62 mm. in diameter; it has flattened whorls, and is carinate up to its anterior extremity, possessing a distinct furrow on each side of the keel. The smaller specimen [B.M. No. C. 19992] is 35.5 mm. in diameter; its whorls are inflated, and on the anterior part of the last whorl the keel is quite obsolete, so that the specimen greatly resembles Blake's *Eg. sagittarium*.

'*Ammonites cervicornis*.'

The Blake collection includes an ammonite [B.M. No. C. 19232], 44.5 mm. in diameter labelled in Blake's own handwriting: 'Am. cervicornis M. L. Peak,' but this species does not appear to be mentioned in his work either as a valid species or as a synonym. The species seems to be allied to Sowerby's *A. brevispina*. It is a very evolute shell, its other dimensions at its greatest diameter (44.5 mm.) being: height of outer whorl (incl. ribs), 12 mm.; width of umbilicus, 24 mm.; thickness of outer whorl (incl. ribs), about 10 mm.

Arietites scipionianus d'Orbigny sp. (p. 287).

A specimen in the Blake collection [B.M. No. C. 17909] is certainly the original of his figure 3 on Plate V., which represents the fossil of about the natural size. It is marked in Blake's handwriting: 'Pl. A., fig. 3,' and bears no locality label. The specimen is entirely septate. Respecting the '*Geological position*' of the species in Yorkshire, Blake writes: 'Zone of *A. Bucklandi* (upper part), Marske, Redcar. Not found *in situ* at Robin Hood's Bay, but in blocks associated with *Lima pectinoides*, *Lucina limbata*, *Dentalium etalense*, *Cerithium etalense*, thus indicating the horizon.' As the specimen bears no locality label, its locality is somewhat doubtful; but as 'Marske' is the first-mentioned locality, there is great reason for regarding that as the locality of the figured example, there being two other examples attributed to this species from the other locality (Robin Hood's Bay) in the Blake collection [B.M. Nos. C. 17931 and C. 17932].

Arietites semicostatus Young and Bird sp. (p. 288).

The example [B.M. No. C. 17935] of this species figured by Blake (Pl. VI., fig. 4a (upper figure)) is on the same block with *Egoceras Pauli* Dumortier already mentioned (see *supra* p. 274).

Arietites difformis Emmrich (p. 289).

A specimen in the Blake collection [B.M. No. C. 17933], evidently

the original of Blake's figure, Pl. VI., fig. 3, is labelled in Blake's handwriting: 'Pl. A., fig. 3,' a 'B' having been written in pencil over the 'A.' Blake's figure 3A represents the fossil of about natural size. If drawn from the same specimen, fig. 3B is somewhat 'improved'; almost the whole of one side of the fossil is obscured by matrix. Blake gives the 'Geological position' of the species in Yorkshire as: 'Zone of *A. Bucklandi*, Redcar and Robin Hood's Bay,' but the figured example bears no locality label and may therefore have been either from Redcar, or from Robin Hood's Bay. As Blake would probably mention first the locality of the figured example, this may be assumed to be 'Redcar,' the matrix agreeing with the matrix of the original of Pl. VI., fig. 4 (*Arietites semicostatus* and *Ægoceras pauli*), also from the 'zone of *A. Bucklandi*' at Redcar.

Arietites (?) *macdonelli* Portlock sp. (p. 290).

Blake figured (Pl. V., figs. 8A, 8B) two examples, which he referred to this species, and both are in the Blake collection.

With respect to the original of Fig. 8A, the form of the anterior end of the original [B.M. No. C. 17874] is copied in the plate, but the rest of the figure is much restored. Not only are portions of the test wanting, but the periphery of the first third of the outer whorl is much weathered. Further the figure is reduced, the greatest diameter of the fossil being 73.5 mm. That it is the figured example there can be no doubt; it is labelled in Blake's handwriting: 'armatus, Warter, Ammonites Macdonelli,' and 'Pl. A., fig. 8A.'

The original of Fig. 8B [B.M. No. C. 17875] is partially embedded in matrix and is represented of about the natural size. It is labelled in Blake's handwriting: 'Pl. A., fig. 8B,' and (? in the same handwriting): 'armatus, Nr. Warter.'

Arietites collenoti d'Orbigny sp. (p. 290).

The Blake collection includes a specimen [B.M. No. C. 18114], 37 mm. in diameter, labelled in Blake's handwriting: 'Am. tenellus L.L., R.H.B.' Since Blake places the species *tenellus* as a synonym of *Arietites collenoti*, this specimen, though not specially mentioned, may be regarded as one of the specimens recognised by Blake as *Arietites collenoti* (d'Orbigny).

There is another ammonite in the Blake collection [B.M. No. C. 18116], 35.2 mm. in diameter, labelled in Blake's handwriting: 'oxynotus, Robin H. Bay. Ammonites collenoti,' that is most probably another of the specimens recorded by Blake.

Arietites impendens G. Young and J. Bird sp. (p. 290).

The Blake collection includes [B.M. No. C. 17936], the original of Blake's Pl. VI., fig. 7. The fossil is marked in Blake's handwriting: 'Pl. B, fig. 7,' and agrees well with the figure which represents the fossil of about two-thirds of the natural size, the greatest diameter of the specimen being 63 mm. The fossil bears no locality label, but since the only horizon and locality given by Blake for this species is: 'Zone of *A. oxynotus*, Robin Hood's Bay,' this must be the horizon and locality of the figured example.

[? *Amaltheus oxynotus* Quenstedt sp. (p. 291).]

There is depicted in Blake's Pl. VI., fig. 10, a small Ammonite which does not appear to be referred to in the text of the work. In the Blake collection there was a small tray containing eight specimens [B.M. No. C. 18043-50], ranging in diameter from 27.6 to 9.6 mm. in diameter. One of these [B.M. No. C. 18044], 13.5 mm. in diameter, seems, so far as can be judged from Blake's very poor figure, to have been the original of that figure. The specimen is not labelled, but its mode

of preservation agrees perfectly with that of the largest specimen in the tray [B.M. No. C. 18043], and this is labelled in Blake's handwriting: 'oxynotus, Cheltenham, Ammonite oxynotus.' Blake makes no reference to the figure in his description of '*Amaltheus oxynotus*' (p. 291), so that it may be that after the specimen was figured, Blake found out that it was not a Yorkshire specimen, so made no reference to it in the body of the work.

Amaltheus simpsoni Bean MS. in Simpson sp. (p. 291).

An unlabelled specimen in the Blake collection [B.M. No. C. 17903], with a slightly imperfect periphery, is obviously the original of Blake's Pl. VIII., fig. 4, the figure representing the specimen as having a perfect periphery and of reduced size, the greatest diameter of the fossil being 90 mm. The aspect of the anterior part of the fossil at once serves to identify the specimen. The '*Geological position*' of this species given by Blake is only: 'Zone of *A. oxynotus*, Robin Hood's Bay,' so that, although the specimen bears no locality label, this must be its horizon and locality.

Amaltheus trivialis Simpson sp. (p. 292).

Blake figured (Pl. V., figs. 6A, B, C, D) four examples which he referred to this species. In the Blake collection was a small tray containing seven specimens, accompanied by a pencil label in Blake's handwriting: '*A. trivialis* Jamesoni, R.H.B.' [*i.e.*, Robin Hood's Bay]. One of these [B.M. No. C. 17891] was labelled in Blake's handwriting: 'Pl. A., fig. 6A,' and undoubtedly is the original of his Pl. V., fig. 6A (nat. size), but it bore no separate locality label. Still, there can be no doubt that the general label was intended to apply to all the specimens, so that the '*Geological position*' of the fossil must be regarded as 'Zone of *A. jamesoni*, Robin Hood's Bay.'

Amaltheus solitarius Simpson sp. (p. 295).

We have not been able to recognise the figured example in the Blake collection. The collection contains two examples. Of these the first [B.M. No. C. 18121] is labelled in Blake's handwriting: 'spinatus, Eston, Am. solitarius ?? (young)'; it is 26.4 mm. in diameter. A second [B.M. No. C. 18122], 30.2 mm. in diameter, is unnamed, but was probably regarded as the same species. It is labelled in Blake's handwriting: 'A. spinatus beds, Hawsker.'

Amaltheus (?) *ferrugineus* Simpson non Oppel sp. (p. 296).

The original of Blake's Pl. VII., fig. 5, is in the Blake collection [B.M. No. C. 17940]. The fossil which is exposed on the surface of a rock-fragment is labelled in Blake's handwriting: 'Pl. C., fig. 5,' and agrees quite well with his figure, which represents the fossil of about the natural size, the apertural portion being very imperfect. The specimen bears no locality label. The '*Geological position*' of the species as given by Blake is: 'Zone of *A. margaritatus* Staithes (1 ex.), Zone of *A. spinatus* Hawsker, Eston, Upleatham, etc.' The horizon and locality of the specimen is, therefore, somewhat uncertain. The matrix of the specimen, however, so closely resembles that of some ammonites in the Blake collection, marked in Blake's handwriting: 'Am. margaritatus, Staithes,' that there is great probability that the figured example is the single specimen noted by Blake from the 'zone of *A. margaritatus* Staithes'; on the other hand, it is quite different from that of a specimen [No. C. 17941] in the Blake collection labelled in his handwriting: 'Am. spinatus beds. Hawsker,' or of a third specimen [No. C. 18105] in the same collection and labelled in the same handwriting: 'spinatus. Hawsker. A. ferrugineus.'

Phylloceras loscombi J. Sowerby sp. (p. 296).

The Blake collection contains a specimen [B.M. No. C. 18115],

labelled in Blake's handwriting: 'A. ibex, M.L. R.H.B.' [=Middle Lias; Robin Hood's Bay], that may be the fossil to which Blake refers (p. 297), as 'one being of the variety having rounded ridges on the front like *P. ibex*.' The specimen is 79.2 mm. in diameter and exhibits rounded ridges on the periphery. Since the specimen is marked in Blake's handwriting: 'A. ibex,' and that that species is mentioned only under *Phylloceras loscombi*, this specimen would seem to be the fossil there alluded to.

Stephanoceras crassum G. Young and J. Bird sp. (p. 300).

The Blake collection includes an ammonite [B.M. No. C. 17902], which is evidently the original of Blake's Pl. VIII., fig. 5, the figure being somewhat reduced, the original being 66.4 mm. in its greatest diameter, and 30 mm. in greatest thickness. It is labelled in Blake's handwriting: 'Pl. D, fig. 5,' but has no locality label. The locality and horizon must therefore be regarded as a little doubtful, the 'Geological position' of the species given by Blake being: 'Zone of *A. communis* and, perhaps, *serpentinus*, Whitby, Boulby, etc.' Blake assigned several of Simpson's species to Young and Bird's *crassus*, and the specimen under consideration he considered to be Simpson's *puteolus* (Blake, p. 300).

Stephanoceras fonticulum Simpson sp. (p. 301).

The original of Pl. I.,* fig. 10 is in the Blake collection [B.M. No. C. 17904], and is well represented of the natural size in Blake's figure. The specimen lacks the morphological right half of the last half whorl. When received it was labelled '10A,' but bears no label indicating its locality and horizon. There can, however, be no doubt as to its being the figured example. Since the only horizon and locality given by Blake for this species is 'Probably zone of *A. serpentinus*, Whitby,' these particulars must be held to apply to the figured example.

Harpoceras algovianum Oppel sp. (p. 302).

A specimen in the Blake collection [B.M. No. C. 17900] is obviously the original of Blake's Pl. VIII., fig. 1. Its label is both imperfect and obscure, but seems to be: 'Pl. D, fig. 1 . . . anus.' There can, however, be no doubt whatever as to the identity of this specimen with Blake's figure, which is reduced, the original being 83.6 mm. in its greatest diameter. The specimen bears no locality label and since for the 'Geological position' of the species Blake records: 'Zone of *A. margaritatus*, Hawsker, Staithes, Marske Mill, Saltburn, Rockcliff (rare);' whilst the horizon of the fossil is the 'zone of *A. margaritatus*,' the exact locality is, therefore, a little uncertain, although the matrix suggests this zone at Hawsker. Blake writes: 'The specimen figured is not a typical example, but one which I refer to this species, although its ribs are stronger and the tubercles are more distinct; but this is probably due to size.'

Harpoceras subconcauum G. Young and J. Bird sp. (p. 304).

Blake's Pl. VIII., figs. 8, 8B, undoubtedly represents of about the natural size a specimen in the Blake collection [B.M. No. C. 17984]. It is labelled in Blake's handwriting: 'Am. Eseri U.L. Whitby,' but this species† is not referred to by Blake. But the form of the anterior end, and the irregularity of the ornaments on the last portion of the outer whorl of the specimen are so clearly indicated in Blake's figure that there can be no doubt as to the identity of the figured example. Blake gives the 'Geological position' of the species as 'Zone of *A. communis*, Peak, Boulby, etc.'

* Unless otherwise stated the figures are not reversed.

† See Oppel, 'Die Juraformation,' p. 245.

Harpoceras simile Simpson sp. (p. 304).

The original of Pl. I., fig. 4, is in the Blake collection [B.M. No. C. 17905]. It is figured of about the natural size, but reversed. Various features of the fossil have been so clearly copied that there can be no doubt whatever about this being the figured example. It was not labelled when received with the Blake collection. The 'Geological position' of the species given by Blake is 'Zone of *A. serpentinus*, Whitby, etc. (Simpson),' and it is, therefore, to be concluded that the figured example is from the Zone and locality mentioned.

Harpoceras lythense G. Young and J. Bird sp. (p. 304).

A specimen in the Blake collection [B.M. No. C. 17906] is evidently the original of his Pl. II., fig. 4. The figure depicts the fossil of about one-half the natural size and is not reversed. The greatest diameter of the specimen is 198.5 mm. When received with the collection it was labelled in Blake's handwriting, 'Ammonites lythensis, Upper Lias, Whitby,' on the side opposite the figured side, and on the figured side merely the figure '4.' The latter most probably indicated the number of the figure on Plate II. The 'Geological position' of the species given by Blake is 'Zone of *A. communis*, Whitby, Passim.'

Harpoceras exaratum G. Young and J. Bird sp. (p. 305).

The Blake collection includes a specimen [B.M. No. C. 17907], which is represented of the natural size in Blake's Pl. II., fig. 5, the details of the piece of matrix at the anterior end being clearly indicated. When received, the specimen bore no labels and no indication whatever of its being a figured specimen. Since the 'Geological position' given by Blake for this species is: 'Zone of *A. serpentinus*, Whitby, etc.,' it may safely be considered that the figured example is from Whitby, and from the zone mentioned.

Harpoceras primordiale Scholtheim sp. (p. 306).

A specimen in the Blake collection [B.M. No. C. 17908] can, by the form of the fractured surface near the aperture and other details, be at once definitely recognised as the original of his, Pl. II., fig. 7. Although not so indicated on the plate, the figure is much reduced, the largest diameter of the fossil being 22.4 mm. The specimen bears neither labels nor writing of any kind, unless some hieroglyphics on the fractured anterior end have any significance. Even these have somewhat the appearance of a private price-mark. There is, however, no doubt whatever about the identification of the specimen as the original of the figure. The 'Geological position' of the species as given by Blake is: 'Zone of *A. communis* (towards the base), Whitby,' so that this must be regarded as the horizon and locality of the figured example.

Harpoceras latescens Simpson sp. (p. 308).

A completely-septate specimen in the Blake collection [B.M. No. C. 17943] labelled in Blake's handwriting: '*A. latescens*, U. Lias, Pl. C., fig. 7,' is obviously the fossil represented of about the natural size on Pl. VIII., figs. 7A, 7B. The label bears no locality, but since the 'Geological position' given by Blake is only: 'Zone of *A. serpentinus*, Whitby,' this must be regarded as the horizon and locality of the figured example.

Harpoceras compactile Simpson sp. (p. 308).

The original of Blake's Pl. VIII., fig. 6, is evidently a specimen in his collection [B.M. No. C. 17944] exposed on the surface of a small lump of matrix, the figure representing the fossil of about the natural size. Further, the fossil is labelled in Blake's handwriting: 'Ammonites compactilis, Peak cliff, Fig. 6, Y.L.' [i.e., Yorkshire Lias]. The 'Geological position' of the species as given by Blake (*op. cit.*, p. 308), is: 'Zone of *A. jurensis*, Peak.'

Harpoceras lectum Simpson (p. 309).

A completely-septate specimen in the Blake collection [B.M. No. C. 17985], without any label whatever, is obviously the fossil represented of about the natural size on Pl. VIII., fig. 7. The outer whorl is denuded of about the natural size on Pl. VIII., fig. 7. The outer whorl is denuded of about the test, and, contrary to what one would expect from the figure, displays the suture-line admirably. The 'Geological position' of the species as given by Blake (p. 309) is 'Zone of *A. jurensis* Peak,' and this, in the absence of any label, must therefore be regarded as the horizon and locality of the figured specimen.

Ammonites aequalis Simpson.

See under *Aegoceras angulatum* Schlotheim sp. (ante, pp. 273-4).

TEUTHIDÆ (p. 313).

Beloteuthis subcostatus Münster (p. 313).

One example of this species was recorded by Prof. Blake (p. 313), but not figured. His description is as follows: 'Pen 10 inches by 4, of a rhomboidal form, with two parabolic wings. The sides below these wings are slightly curved. The ends of the wings curve by a double flexure into the part beyond, and reach to about $\frac{1}{2}$ the length of the pen. Midrib large, broadening towards the end; the sides thrown into gentle folds, and covered with light striæ, making an angle of 30° with the upper part of the midrib.'

'Geological position.—Zone of *A. serpentinus*, Kettleless (1 ex.).'

The Blake collection contains an example of this species [B.M. No. C. 12046], agreeing very well with the above description. It is labelled in Blake's handwriting: 'serpentinus, Whitby, *Beloteuthis subcostatus*.' It is displayed upon the surface of a slab, and the pen measures about 9.5 inches by 4, the lower end being imperfect. There can be no doubt that this is the example referred to by Blake, the locality 'Kettleless' being only about 5 miles N.W. from Whitby.

Beloteuthis leckenbyi J. F. Blake (p. 314).

There is no example of this species in the British Museum collection. Blake's holotype is according to Woods (Catalogue of the Type Fossils in the Woodwardian [now the Sedgwick] Museum, Cambridge, 1891, p. 125) in the Leckenby collection in the Woodwardian Museum, Cambridge.

Geoteuthis coriaceus Quenstedt (p. 314).

Blake described the species as follows: 'Pen obtuse at the end; slightly expanding above; keel almost absent; oblique lines feeble; often showing the ink-bag, which is about the size and shape of a nut, and has a narrow neck; the pen is not very inflated; the sides of the upper end project beyond the middle; no signs of any lateral wings. The figure represents the lower end.'

'Geological position.—Zone of *A. serpentinus*, Hawsker (4 exs.).'

The figured example is in the Blake collection [B.M. No. C. 12047]. It consists of only the posterior end of the pen, displayed on the surface of a small block bounded anteriorly by the surface of a natural fissure. The figure is reduced; the greatest length of the specimen being about 101 mm. It bears an original printed label as follows: 'From Hawsker Bottoms, near Whitby,' and it is also labelled in Blake's handwriting: 'Pl. 8, fig. 1.' There are no other examples in the Blake collection.

Teudopsis cuspidatus Simpson (p. 314).

The original of Blake's figure (Pl. IV., f. 3) is stated by Woods (Types and Figured Specimens in the Woodwardian [now the Sedgwick] Museum, Cambridge, 1891, p. 131) to be in the Leckenby collection in the Sedgwick Museum, Cambridge. Blake mentions three examples, and it is not quite clear whether all were in the Leckenby collection. There are no examples in the Blake collection.

YORKSHIRE NATURALISTS AT THORNTON DALE.

W. H. PEARSALL, D.SC., AND F. A. MASON, F.R.M.S.

THE Whitsuntide Meeting of the Yorkshire Naturalists' Union was held from June 3rd to 5th, headquarters being located at Thornton Dale (near Pickering), a charming old-world village which thoroughly deserves its reputation as one of the most beautiful in England. The general object of the meeting was the investigation of the southern valleys of the Cleveland hills. With the country side at its best, and favoured by perfect weather, the muster of members was so large that the available accommodation was severely taxed. In addition, the occasion had a certain historic interest, since it was the 300th meeting of the Union.

For most of the time the party worked in two groups, the zoologists under the able guidance of the head-keeper, Mr. J. Green, departing to photograph and observe some of the less common birds. The main body devoted June 3rd and 5th to examining the southern end of the Ellerburn Valley, led by Mr. A. I. Burnley, whose local knowledge proved of the greatest service. On these days members had an opportunity of examining the Saxon remains incorporated in the Ellerburn Church. On June 4th a visit was paid to the estate of the Forestry Commission.

AFFORESTATION (T. W. Woodhead).—This excursion afforded the members an excellent opportunity of inspecting one of the sites selected by the Forestry Commission for planting, and by the courtesy of Mr. J. A. K. Meldrum, the Commissioner for this area, and under his able guidance, the work in progress was seen to advantage. In the neighbourhood of Allerston, High Dalby, and Low Dalby, the Commissioners are planting an area of about 10 square miles, and it was interesting to compare the methods here adopted with the attempts previously made on the Pennine slopes, by landowners and municipal authorities, where so much planting has been done in the past on exposed wind-swept areas. On the Cleveland site experience has shown that young trees purchased and introduced from other districts are not so successful as those raised on the site, and a nursery several acres in extent has been established, and here seeds are tested, treated and sown in preparation for transplanting, some of the seeds being obtained from trees growing on the estate. The seedlings were making good progress and active transplanting was going on. Commencing in the valleys and lower levels, the slopes are being steadily invaded, chiefly by conifers, and along the ridges are screens of deciduous trees. Mr. Meldrum pointed out that foresters frequently introduced the beech, not only as a protection to the conifers, but also to enrich the soil. Transplanting is done by aid of an ingenious frame which not only economises time, but ensures more regular and effective planting. A gang of five men being able to plant about 20,000 seedlings a day, and on piece work earn 10/- to 11/-. Careful attention has been paid to the financial side, and as a result, working costs have been greatly reduced. It is hoped that under the skilful management of Mr. Meldrum, the effort will meet with complete success.

BOTANICAL SURVEY (W. H. Pearsall).—Although the moorlands of N.E. Yorkshire have been fully described by Elgee, very little is known about the woodlands in this area. Considerable attention was therefore given to the woods in the Ellerburn Valley. Speaking generally, the vegetation of the district falls into three groups, (1) on the flat tops of the plateaux the soil is thoroughly leached, and bears calluna heath, with plantations or sub-spontaneous woods of Scotch pine, (2) on the steep valley slopes a varied series of woodlands represent the native vegetation, (3) in the bottom of the valleys are alluvial pastures, with remains of the primitive alder swamps, and flushes whose waters are charged with lime removed from the soil and strata of the higher levels.

The valley slopes bear three main types of woodland, (1) oak woods, (2) ash-oak woods, (3) beech plantations. The last are confined to the gentler slopes near Thornton Dale, the oak woods occur higher up the valley (High Dalby). In general, the oaks and birches shew a parallel distribution. *Quercus robur* and *Betula verrucosa* are most abundant at the southern end of the valley, while *Q. sessilis* and *B. pubescens* are almost confined to the more acid soils at the higher northern end.

The variation in the composition of the woods appears to be due to changes in the underlying strata, and variations in the depth of the soil. The operation of these factors is well illustrated in Dalby Nut Wood. While most of this wood is developed over a slightly calcareous sandstone, the upper part reaches the cap of oolitic limestone which here covers the plateau. Owing to soil movement on the steep slopes, the soil is deepest and least calcareous towards the base of the wood—it is shallowest and contains most lime near the top. The upper part of the wood contained (in round figures) 60% ash and 25% oak, with a ground flora of *Mercurialis* and garlic. The lower part 60% oak, 15% ash, and about 15% birch, with a rather open ground flora of *Anemone*, *Oxalis*, *Luzula pilosa* and *Mnium hornum*. The soil in the last case was distinctly acid. This wood is unfortunately being cut down.

A similar effect, due to the arrangement of the strata, is seen south of this point, where the wood had long been removed. The lower half of the slope is clothed with *Pteris* on *Agrostis*—*Anthoxanthum* grassland—on fairly deep acid soil. The upper half of the slope is dry oolitic rubble, on which great colonies of *Mercurialis*, *Convallaria*, *Hypericum hirsutum*, *Inula Conyza* and columbine still persist.

Around Ellerburn there are definite evidences of the succession of woodland vegetation. In some of the woods there were practically no oaks. These woods had been cut about twenty years previously, and ash had recolonised the site more quickly than the oak which formerly had been present in fair quantity. On the quarry wastes ash is usually the most abundant tree, but sycamore runs it very close. The relative preponderance of these two trees (as seedling colonists) seemed to be determined very largely by the amount of light. In the beech plantations sycamore was much the most abundant, but round the wood margins (in high light intensity) ash was more successful.

The woods north of High Dalby are developed on soils derived from slightly calcareous sandstone. The soil is open, dry and thoroughly leached (acid). Here are the oak woods in which *Quercus sessilis* is abundant, birches (chiefly *B. pubescens*) being only frequent round the edges of the wood. The ground flora is of the *Anthoxanthum-Dicranum-Pteris* type, and where the woods have been cut, *Calluna* rapidly becomes sub-dominant. This type of woodland now remains as a whole only on the south-facing slopes, the north-facing slopes being usually covered with heather. A striking exception, however, is the wood on the Crosscliff escarpment, a north-facing slope of one in three. This wood is composed of Oak (60% both species), Birch (20% both species) and Mountain Ash (20%). The ground flora is unusual—principally *Dryopteris dilatata*, *Vaccinium Myrtillus*, *Oxalis* and *Dicranum majus* with other heathy species. Although the soil is an open peat, and very acid, it only shews a very slight deficiency of bases (Comber's test). The light intensity was only 17-20% of full sunlight at 2 p.m. Calculation shews that on a similar south slope, the light intensity under the same trees would be about 40%, a value actually obtained in the High Dalby Wood (at 10 a.m.). The difference in the amounts of radiation thus indicated would, of course, be much more striking earlier or later in the day—when a north slope may receive no direct radiation, and as a result, not only will the daily light conditions be much less favourable, but the soil would also be colder and moister.

The upper edge of the Crosscliff escarpment is crowned by a very

fine example of the 'Vaccinium edge' described by Moss. Here occur *Cornus suecica* and *Trientalis europea*.

A marked contrast to the oak woods was offered when the vegetation of the valley bottom was examined. An interesting alder wood (*A. microcarpa*) on alluvium just above the 'fish pond' seem to illustrate the primitive vegetation of these bottoms. *Carex acutiformis*, *Spiræa*, *Caltha* and *Juncus sylvaticus* were the most abundant species of the ground flora. Two possible lines of development seemed possible for this wood. Where the soil level is being raised by further silting, ash is frequent, and will probably finally become the dominant tree. Where the soil level is being raised by accumulation of organic matter, soil acidity is developing, with a transitional vegetation of *Sphagnum*, *Molinia*, *Calluna* and *Erica tetralix*. In several places, the influence of calcareous flush waters is shewn. These limey flushes are best seen on the eastern slopes of the valley. They produce a 'marly' soil (20-50% of calcium carbonate) bearing a vegetation of *Schoenus nigricans*, *Hypnum commutatum*, *Blysmus compressus*, *Eleocharis multicaulis*, *Carex dioica*, *Selaginella*, etc. Associated with these, but apparently rooting in the humus above the marl, are heath species like *Nardus*, *Molinia*, *Calluna*, *Dicranum scoparium* and *D. Borjeani*. A curious feature of these flushes was the absence of all but the commonest mosses; on the other hand the alga *Spirogyra variabilis* was exceptionally plentiful.

FLOWERING PLANTS (A. I. Burnley).—On Saturday morning the party explored the western side of the Ellerburn Valley. In the coralline oolite quarries the burnet rose was found in bloom. The members next investigated the beech wood close by, and saw the fly and greater butterfly orchids in plenty. This year the bird's nest orchid was scarce. Near at hand, the sweet and hairy violets, and a hybrid between the two, were common. Cleistogamous flowers of the violets were plentiful. In the part of the wood nearer Ellerburn, where the beech is almost entirely replaced by poor ash, columbine, hairy Saint John's wort, and ploughman's spikenard were noted. On an open, dry limestone slope, the common rock rose and lesser burnet were common, as might be expected, and the pill-headed sedge was also there.

At Ellerburn a large patch of monkshood (probably an escape) had found a habitat suitable to its liking by the stream side, and near at hand the common barberry was examined for the fungus causing 'rust' on wheat, but with no result.

The most interesting feature of the day was the examination of the dry, treeless slopes west of Dalby Warren. The occurrence of wood anemone, fly orchid, ploughman's spikenard, stone bramble, shade-loving ferns, etc., shows that probably a wood formerly occupied this locality, but not within the memory of Mr. J. Green, the keeper. White bryony was trailing about, and viper's bugloss seems to be a recent invader.

Dalby Wood was next visited for lilies-of-the valley, herb paris, spindle-tree columbine and baneberry. The place was remarkably rich in the two last-named plants, and it is unfortunate that the wood is being cut down.

A small party tramped to Crosscliff on Whit Sunday. On the way up the valley, the green-winged orchis and the dwarf orchis were growing in a meadow with the greater burnet not far away. The locality for the dwarf orchis (*Orchis ustulata*) was by no means typical.

At Crosscliff, at the upper edge of the escarpment, dwarf cornel, chickweed, winter-green, common cow-wheat, ling, crowberry, cowberry and bilberry seemed to be struggling for space above the wood clothing the scarp. The blooms of the cornel were less common than usual. The writer has found cornel on Blakey Topping. At the Hole of Horcum the cornel was seen at a considerable distance down the slope, and on the adjoining moor top specimens of the dwarf tway-blade were gathered.

On Monday an investigation was made of the Ellerburn marsh and of the area round the calcareous springs at the lower end of Sand-dale. The marsh yielded the spinulose buckler fern, saw-wort with quite simple leaves, and the meadow thistle (*Cirsium britannicum* Scop.)

Round the springs the black bog rush was abundant, and Dr. Pearsall confirmed a previous record of *Scirpus multicaulis*, recorded previously in only one locality in Baker's 'North Yorkshire.'

Among other interesting plants found were mountain catsfoot and the purple mountain vetch.

HEPATICS (F. E. Milsom).—The hot weather which preceded Whit-week was not conducive to the finding of hepatics, everything being very much dried up. However, in the moister places, several interesting species were obtained.

Near Saltersgate *Anthoceros punctatus* was found growing with *Blasia pusilla*. Interesting, too, was the large quantity of *Aneura pinguis* in fine fruit growing amongst *Hypnum commutatum* in the streamlets near Whitecliff Rigg.

Other hepatics gathered are as follows:—

<i>Conocephalum conicum.</i>	<i>Lophocolea bidentata.</i>
<i>Marchantia polymorpha.</i>	<i>L. cuspidata.</i>
<i>Pellia epiphylla.</i>	<i>Cephalozia bicuspidata.</i>
<i>Metzgeria furcata.</i>	<i>Calyptogeia trichomanis.</i>
<i>Alicularia scalaris.</i>	<i>Lepidozia reptans.</i>
<i>Gymnocolea inflata.</i>	<i>Diplophyllum albicans.</i>
<i>Lophozia ventricosa.</i>	<i>Scoparia dentata.</i>
<i>L. porphyroleuca.</i>	<i>S. undulata.</i>
<i>Plagiochila asplenoides.</i>	<i>S. irivigua.</i>
<i>Chiloscyphus polyanthus.</i>	<i>Frullania Tamarisci.</i>

LICHENS (W. E. L. Wattam).—An examination of many of the walls and trees within the precincts of the village, despite their dusty covering, showed that when more congenial conditions for lichen growth returned, a charming colour scheme would greet the eye. The walls would appear to be chiefly comprised of the local rocks, for particulars of which Elgee's 'The Moorlands of North-east Yorks.' pp. 192-195 should be consulted. The species noted on the walls and trees were:—

<i>Pannaria rubiginosa</i> Del. in Dub.	
<i>Parmelia perlata</i> Ach.	<i>P. saxatilis</i> Ach.
<i>P. conspersa</i> Ach.	<i>P. fuliginosa</i> Nel.
<i>Xanthoria parietina</i> Th. Fr.	
<i>X. stellaris</i> Nyl. and var. <i>leptalea</i> Nyl. (on old apple tree).	
<i>Squamaria saxicola</i> Poll.	
<i>Placodium callopismum</i> Maeg.	<i>P. sympageum</i> Ach.
<i>Callopisma vitellinum</i> Sydow.	<i>C. expixantha</i> Nyl (on tree boles).
<i>Lecanora galactina</i> Ach.	<i>L. dissipata</i> Nyl. <i>L. dispersa</i> Nyl.
<i>L. crenulata</i> Nyl.	<i>L. varia</i> Ach.
<i>L. atra</i> Ach.	<i>L. parella</i> Ach.
<i>Pertusaria communis</i> D.C.	<i>L. symmetricata</i> Ach (on old palings).
<i>Lecidia contigua</i> Fr. (stones stream side).	
<i>Mycoblastus sanguinaria</i> Ach.	
<i>Bilimbia sabuletorum</i> Branth et Rostr. (on dead moss wall tops).	
<i>Verrucaria margacea</i> Wahl. (stones in stream).	<i>V. muralis</i> Ach.

The beech and ash woods on the way to Ellerburn, the churchyard wall at Ellerburn, the trees and walls beyond the fish pond, and the calcareous flushes to the east of the valley yielded the following additional species:—

Collema pulposum Ach. Amongst the calcareous debris of the water flushes.

Leptogium scotinum Fr. On the calcareous covered rocks in the streams branching from the water flushes, and also on *Chara hispida* in the lesser water runnels.

- Peltigera canina* Hoffm. Amongst dead mosses.
Platysma glaucum Nyl. Common on trees and walls.
Ramalina farinacea Ach. On Scots pine and spruce.
Evernia furfuracea Fr. Common on walls and trees.
E. furfuracea var. *ceratea* Nyl. On wall tops.
Parmelia perlata Ach. Trees.
Parmelia saxatilis f. *furfuracea* Schaer.
P. fuliginosa var. *laetevirens* Nyl.
Parmelia physodes Ach. and f. *labrosa* Ach.
Lecanora Hageni Ach. On aged oaks.
L. pallida Schaer. On beech. *L. parella* Ach.
Pertusaria globulifera Nyl. On aged oaks. *P. amara* Nyl. On aged oaks.
P. lactea Nyl. On aged oaks. *P. Wulfenii* D.C. On aged oaks.
Acarospora fuscata Nyl. Walls. *A. smaragdula* Koerb. Walls.
A. pruinosa Jatta. Aged oaks and mountain elm.
Cladonia pyxidata Fr. and f. *myricarpa* Cromb. Moss-covered stumps.
C. fimbriata Fr., and var. *tubæformis* Fr. Moss covered stumps.
C. gracilis Hoffm., and var. *choralis* Floerke. Moss covered stumps.
C. squamosa Hoffm. Amongst dead and living mosses.
C. macilenta Hoffm. On dead grass and old stumps.
Lecidia querneæ Ash. On aged oaks.
L. coarctata Nyl., and var. *elacista* Cromb. Walls.
L. parasema Ach. Oak and ash. *Arthonia lurida* Ach. Beech.
Opegrapha varia Pers. Beech. *O. vulgata* Ach. Ash.
Verrucaria hydrelæ Ach. Stones in stream.

The portion of Pexton Moor investigated resulted in the following additional species being met with :—*Cetraria aculeata* Fr., in abundance, also f. *hispida* Cromb. and f. *acanthella* Nyl.; *Cladonia cervicornis* Schaer., *C. sylvatica* Nyl., *C. furcata* Hoffm., *C. uncialis* Nyl., *C. coccifera* Schaer.

A walk through Dalby Dale to the 'Bride Stones,' then across the moor to Crosscliff, subsequently recrossing the moor and descending one of the ghylls into Staindale, proved instructive from many standpoints. The species noted on the remarkable blocks of grit known as the 'Bride Stones' were :—

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|--|--|
| <i>Evernia furfuracea</i> var. <i>ceratea</i> Nyl. | <i>Gyrophora polyphylla</i> Turn et Bov. |
| <i>Parmelia saxatilis</i> Ach. | <i>Cladonia macilenta</i> Hoffm. |
| <i>P. omphalodes</i> Ach. | <i>Lecidia confluens</i> Ach. |
| <i>P. physodes</i> Ach. | <i>Rhizocarpon viridiatrum</i> Koerb. |
| <i>Lecanora polytrups</i> Schaer. | <i>R. confervoides</i> D.C. |
| <i>Pertusaria communis</i> D.C. | <i>R. obscuratum</i> Mass. |

Other species not previously recorded, and noted during this walk, were :—

- Collema furvum* Ach. On calcareous blocks in the stream.
Colorina saccata Ach. On the peat.
Sphaerophorus coralloides Pers. Grit blocks.
S. coralloides Pers. Grit blocks.
Usnea hirta Hoffm. On dead Scots pine.
Haematomma coccineum Koerb. Grit blocks.
Bæomyces rufus D.C. On grit blocks in the ghyll.
Pcynothelia papillaria Duf. On the peat.
Cladonia bacillaris Nyl et Cromb. On the peat.
C. Floerkeana Fr. On the peat.
Lecidia granulosa Schaer. On the remains of old 'Swiddens.'
L. uliginosa Ach. On the peat.
L. contigua var. *platycarpa* Fr. On grit blocks.
L. rivulosa Ach. On grit blocks.

MYCOLOGY (F. A. Mason).—Fungi were collected in three of the areas to which reference has been made in Dr. Pearsall's ecological notes; the Beech-woods, the Ash-Oak woods and the Alder-Willow association and adjacent springs at Ellerburn. Additional investigation was made of

the district covered by the Forestry Commission's plantations at Allerston, which included recently-felled coniferous woodland, and a Larch-Spruce plantation.

The Beech-woods produced neither agarics nor polypores, the only fungi met with being those found on plants forming the undergrowth, chiefly at the edges of the woods. The following species were noted :—

<i>Cystopus candidus</i> Lév.	<i>Phragmidium mucronatum</i> Schlecht.
<i>Plasmopara nivea</i> Schroet.	<i>Septoria Hederæ</i> Desm.
<i>Peronospora Violæ</i> De Bary.	<i>Phyllosticta Hedericola</i> Dur. et Mont.
<i>P. alta</i> Fuck.	<i>Phacidium multivalve</i> Fr.
<i>Sphaerotheca pannosa</i> Lév.	<i>Stegia ilicis</i> Fr.
<i>Uromyces Ficariæ</i> Lév.	<i>Tricothecium roseum</i> (Link) Fr.
<i>Puccinia Baryi</i> Wint.	<i>Botrytis vulgaris</i> Fr.

In the Ash-Oak woods, now felled and quite open, several agarics and common polypores were noted, and these are included in the following list, which, with a few exceptions, is made up of species parasitic on flowering plants :—

<i>Psalliota xanthoderma</i> W. G. Sm.	<i>P. Leontodontis</i> Jacky.
<i>Stropharia semiglobata</i> (Batsch) Fr.	<i>P. variabilis</i> Grev.
<i>Hypholoma epixanthum</i> Fr.	<i>P. Hieracii</i> Mart.
<i>Psilocybe foenicicii</i> (Pers.) Fr.	<i>P. tumida</i> Grev.
<i>Polyporus squamosus</i> Fr.	<i>P. Violæ</i> D.C.
<i>Polystictus versicolor</i> Fr.	<i>P. fusca</i> Wint.
<i>Stereum hirsutum</i> (Willd.) Fr.	<i>P. Lychnidearum</i> Link.
<i>Lycoperdon pyriforme</i> (Schaeff.) Pers.	<i>P. Baryi</i> Wint.
<i>Uromyces Ficariæ</i> Lév.	<i>Phragmidium mucronatum</i> Schlecht.
<i>U. Acetosæ</i> Schroet.	<i>Peronospora Viciæ</i> De Bary.
<i>U. Poæ</i> Raben.	<i>Aegerita candida</i> (Pers.) Fr.
<i>Puccinia obtogens</i> Tul.	<i>Cladosporium herbarum</i> Link.
<i>P. Hypochoeridis</i> Oud.	<i>Tubercularia vulgaris</i> Fr.

The damper alder wood and the springs proved to have an interesting mycologic flora, and two very uncommon species were obtained. One of these, a stipitate polypore, *Polyporus fuscidulus* Fr. (teste A. Clarke) was found by Mr. Greevy Fysher on a fallen alder branch; the other species, *Cantharellus lobatus* Fr., occurred on *Hypnum commutatum*, and was found by Mr. W. E. L. Wattam. In addition to these the following species were collected :—

<i>Mycena galepiculata</i> Fr.	<i>Puccinia Menthæ</i> Pers.
<i>Omphalia umbellifera</i> (Linn.) Fr.	<i>Triphragmium Ulmaricæ</i> (Schum.) Link.
<i>Galera tenera</i> (Schaeff.) Fr.	
<i>G. hypnorum</i> (Schrank) Fr.	<i>Frankiella alni</i> (Wor.) Maire.
<i>Tubaria furfuracea</i> (Pers.) W.G.Sm.	<i>Erysiphe graminis</i> D. C.
<i>Stropharia squamosa</i> var. <i>thrausta</i> Fr.	<i>Hypocrea rufa</i> (Pers.) Fr.
<i>Fomes nigricans</i> Fr.	<i>Acetabula vulgaris</i> (Linn.) Fuck.
<i>F. Salicinus</i> Fr.	<i>Ciliaria scutellata</i> (Linn.) Grev.
<i>F. resupinatus</i> Masee.	<i>Ombrophila clavus</i> Fr.
<i>Exidia glandulosa</i> (Bull.) Fr.	<i>Helotium cyathoides</i> (Bull.) Karst.
<i>Phoma samararum</i> (Desm.) Sacc.	<i>Mollisia cinerea</i> (Batsch) Karst.

During the excursion to Allerston, a noteworthy observation was made in connection with the occurrence of the mycetozoon, *Reticulata Lycoperdon* Bull., on charred conifer stumps left after felling and burning the plantation above Givendale, at an altitude of 500-600 feet. The stumps appeared to be so thoroughly carbonised, and so dry, that it was cause for surprise that they could support vegetation of any kind, yet many scores of them each bore one or more specimens of *R. Lycoperdon*, in either the plasmodium or the aethalium stage. No reference to this habitat of *R. Lycoperdon* is made by Miss G. Lister in her 'Monograph of the Mycetozoa,' and I am unaware of any previous observation giving evidence of its colonising habit on charred wood. It is well-known that several species of fungi flourish on charcoal, and on charred ground after

camp fires, etc., search for the latter was made in vain, the conditions, at the time, being altogether too dry for their development.

Mr. Meldrum reported the presence of *Trametes pini* Fr. in the Larch-Spruce plantation, but no sporophores were seen. The latter locality yielded the mycetozoa, *Lycogala epidendrum* (Linn.) Fr., *Trichia varia* Pers. and *T. Botrytis* Pers.

Reference to other species of fungi is made in my notes on 'Economic Biology.'

ECONOMIC BIOLOGY (F. A. Mason).—Owing to the luxuriant condition of vegetation generally, damage by plant pests and diseases was not conspicuous. A close examination of some of the gardens in the village, however, showed that the pernicious work of several injurious insects and fungi was in progress.

Fruit trees, on the whole, presented a healthy appearance, and were bearing heavy crops. Plums, in several cases, were badly infested by *Aphis pruni* Reaum., and in one garden, a tree was seen to be attacked by the mite *Eriophyes phloeocptes* Nal., causing Plum-leaf gall.

Apple trees suffering from Canker, due to the fungus, *Nectria ditissima* Tul., were not infrequent, and in the Vicarage garden, one tree was attacked by *Monilia cinerea* Bon., which causes Apple Blossom Wilt. A third fungus, *Sphaeropsis malorum* Peck. manifested itself as Apple Leaf-Spot.

Two insects seen on Apple tree trunks and branches were the Mussel Scale, *Mytilaspis pomorum* Linn., which devitalises the tree by extracting the sap, and the Apple Root Louse, *Eriosoma lanigera* Htg., the two species frequently occurring together.

Big Bud on blackcurrants caused by the mite *Eriophyes ribis* Nal. and the leaf-curling Green Fly, *Myzus ribis* Linn., were both common.

Plants of the kitchen garden were particularly free from pests, and no signs of the usually common Black Fly, *Aphis rumicis* Linn., were observed.

Cultivated roses were seriously attacked by Rose Rust, *Phragmidium mucronatum* Schlecht. This fungus was particularly common on the wild roses of the district, and, in the gardens, bushes were rendered unsightly by gall-like masses of orange-coloured spores bursting through the epidermal tissues of the stem. Rose mildew, *Sphaerotheca pannosa* Lév., was less commonly present.

In the Beechwoods, the Felted Beech Coccus, *Cryptococcus fagi* Barends. was in evidence. In other places, Larch and Spruce were both attacked by the Spruce Gall Aphid, *Chermes abietis* Linn.; the old cone-like galls of this insect were pointed out by Mr. Meldrum, at Allerston, and the complex life-history of the aphid was explained by him. The Larch Canker fungus, *Dasyscypha calycina* Fuck., was found on fallen branches. Damage to other conifers by the Pine Weevil, *Hylobius abietis* L. was reported by Mr. Meldrum.

VERTEBRATE ZOOLOGY (H. B. BOOTH).—Birds were numerous in individuals as well as in species. The time of the year was just right, as practically every bird was engaged in some part of its breeding duties. Leaving out those species which are common and generally distributed, the following is a list of the birds seen:—Carrion Crow, Jay, Goldfinch, Linnet (very common), Bullfinch, Yellow Hammer, Tree Pipit, Tree Creeper, Goldcrest, Coal Tit, Marsh Tit, Long-tailed Tit, Lesser Whitethroat, Garden Warbler, Blackcap, Sedge Warbler, Wood Warbler, Chiffchaff, Mistle Thrush (one still incubating), Ring Ouzel, Redstart, Whinchat, Wheatear, Dipper, Pied Flycatcher, Green Woodpecker (comparatively common), Nightjar, Kingfisher, Long-eared Owl, Tawny Owl, Sparrow Hawk, Kestrel, Woodcock, Common Sandpiper, Curlew, Golden Plover, Stock Dove and Turtle Dove.

Only one pair each was noted of the Goldfinch, the Lesser Whitethroat and the Golden Plover. Goldcrests were scarce, excepting in the Spruce

plantations round the old disused ironworks near Levisham railway station, where there were many pairs. House Martins were nesting in small numbers on the cliff face in the same dale. Woodcocks in their vesper flight at about 9-30 p.m. came right up to the end of the village; uttering their peculiar cry, viz., two short notes and a grunt. Mrs. Fysher, found a Yellow Hammer's nest containing three eggs of that bird, and also three eggs of the Willow Warbler. The nest and surroundings did not show any sign of having been tampered with. As the Yellow Hammer was incubating, it would be interesting to know what will become of the young Willow Warblers.

There was plenty of evidence of the presence of Foxes and Badgers.

Of Reptiles, the Viper and the Viviparous Lizard were fairly common, and of Amphibians, the Great Crested—and the Smooth—Newts appeared to be equally common in some horse-ponds.

Trout were seen in the stream in the village.

This section had the exceptional advantage of the guidance and leadership of Mr. Jim Green, the head gamekeeper, to whom they were greatly obliged and indebted.

MOLLUSCA (Greévz Fysher).—As the weather during this Excursion was warm and bright the terrestrial mollusca visible were not numerous, but the following species were collected, and vouched for by John W. Taylor, M.Sc. :—*Helix nemoralis*, *Hygromia striolata*, *Xerophila virgata*, *X. caperata*, *Ena obscura*, *Claus. bidentata*, *Limax flavus*, *L. flavus* v. *virescens*, *Limnea peregra*, *L. truncatula*, *Bythinia leachii*, *B. tentaculata*, *Planorbis albus*, *P. fontanus*, *Sphaerium lacustre*, *Pisidium cinereum*, *P. pulchellum*, *P. annicum*, *P. subtruncatum*.

Helix aspersa was also observed.

The aquatic species were principally collected from a small stream flowing from one of the limestone springs near Ellerburn. This little watercourse was in some parts quite full of Chara, on some of which Mr. Wattam found a small mollusc. This was so encouraging that little time was lost in getting to the place, but at first examination of a quantity of Chara gave no result. By dredging with an ordinary scoop, however, the species enumerated were obtained.

Sphaerium lacustre is much more sparingly distributed than *Sphaerium corneum*.

From this little stream a plentiful supply of *Limnea truncatula* was obtained, the animals evidently living constantly under water. Not long ago a colony of this species was observed in a dry quarry at Linton Spring, near Leeds, and some of the specimens which were observed in confinement appeared very reluctant to remain below the surface of water in the vessel where they were confined. This mollusc is especially interesting to physiologists because it is the host of one of the alternate generations of the liver fluke in sheep, and the observations reported above might also suggest some light upon the transmission of acquired characteristics. No masses of spawn have yet been observed in the habitat of the colony living in a dry quarry, but if such should ever be obtained, and if the animals hatched from them should shew any reluctance to aquatic life, this observaton could not fail to be of weight in the discussion.

Sectional Reports were rendered at the general meeting, held at Headquarters on Monday, June 5th, the President being in the Chair. Cordial votes of thanks were carried to the landowners who had so kindly thrown open their estates to the Union, and also to Mr. J. A. K. Meldrum, Mr. A. I. Burnley and Mr. J. Green, whose guidance and local knowledge had done so much to facilitate the work of the meeting. Six new members were elected.

NINETY YEARS OF SCIENCE.

MOST opportunely, the Secretary of the British Association, Mr. O. J. R. Howarth, has just prepared a 'Retrospect, 1831—1921,' which has been published by the Association at 7s. 6d. There are over 300 pages, in which a fascinating narrative of the Association is given. There are several illustrations of the more important scientists who have contributed to the success of that body. These include:—Sir David Brewster, Rev. William Vernon Harcourt, F.R.S., Professor John Phillips, Sir Roderick I. Murchison, Bart., Rt. Hon. Professor T. H. Huxley, Professor John Tyndall, Rev. Professor Adam Sedgwick, Rev. Professor William Whewell, Rt. Hon. Lord Kelvin, Sir William Crookes, and Rt. Hon. Lord Rayleigh.

The British Association for the Advancement of Science was founded in 1831. The circumstances of its foundation may briefly be correlated with the history of the time. In 1814 the Peninsular War was brought to a successful issue. Napoleon abdicated, to return in the following year to momentary power, which was finally brought low at Waterloo. The war, in England, had been (as in the present generation) the pre-occupation of every man; its aftermath, too, exhibits certain obvious parallels with the circumstances of the present day. The period of reconstruction was (as it needs must be) protracted, and in England, in certain respects at least, more so than elsewhere. The industrial revolution had brought with it an independent class sentiment among the industrial population on the one hand, and the agricultural and landowning classes on the other; the evils associated with the concentration of large industrial communities were intensified by the financial burden and inflation of prices consequent upon the war, and superposed on all this was the existence of an unrepresentative parliamentary system. Already before 1814 the 'Luddite' bands of workless artisans had attacked factories equipped with labour saving machinery, which was regarded as the immediate cause of unemployment, and from such incidents alone (apart from other conditions) it may reasonably be assumed that neither labour on the one hand nor the Government on the other, would be favourably disposed towards the advancement of applied science. The prevalent distress germinated in 1819 into the cry for parliamentary reform, but thirteen years of struggle passed before the Reform Bill became law (1832).

Class patriotism, then, had succeeded common patriotism—the succession was inevitable in these years, no less than a century later—and the representatives of science were no doubt inspired (or infected) by it. In certain directions, as we have said, reconstruction in England lagged behind that in other countries: the advancement of science supplied an instance. From about 1826 onward this state of affairs began to find loud expression through many eminent scientific men of the time. John Herschel and Playfair were among the first to speak out; Sir Humphrey Davy began a book upon the subject, but died (1826) before completing it. Charles Babbage, however, while Lucasian Professor of Mathematics at Cambridge, published (1830) his *Reflections on the Decline of Science in England*, and this work was dealt with in the *Quarterly Review* by Sir David Brewster, whose article is not only a review of Babbage's book, but of the whole position of science in this country as compared with others.

Brewster was a man capable of strong sympathies, and (on required occasions) an ardent champion; and the common literary style of the period was certainly not a medium for understatement. 'The return of the sword to its scabbard,' he wrote, 'seems to have been the signal for one universal effort to recruit exhausted resources, to revive industry and civilisation, and to direct to their proper objects the genius and talent which war had either exhausted in its service or repressed in its desolations. In this rivalry of skill, England has alone hesitated to

take a part. Elevated by her warlike triumphs, she seems to have looked with contempt on the less dazzling achievements of her philosophers, and, confiding in her past pre-eminence in the arts, to have calculated too securely on their permanence. Bribed by foreign gold, or flattered by foreign courtesy, her artisans have quitted her service—her machinery has been exported to distant markets—the inventions of her philosophers, slighted at home, have been eagerly introduced abroad—her scientific institutions have been discouraged and even abolished—the articles which she supplied to other States have been gradually manufactured by themselves; and, one after another, many of the best arts of England have been transferred to other nations. . . . The abolition of the Board of Longitude, the only scientific board in the kingdom, at last proclaimed the mortifying intelligence that England had renounced by Act of Parliament her patronage even of the sciences most intimately connected with her naval greatness.'

The existence of such conditions as this sombre picture delineates is scarcely a matter for wonder when the political and economic state of the country is recalled; but Brewster did not blame that solely or even primarily. He hit out all round. He was severe (in a manner which is still not unfamiliar) upon our learned societies, although he admitted that 'persons who are deeply occupied with their own studies and affairs cannot devote much personal attention to the management of the societies of which they happen to be influential members'; but he rated the Royal and other societies for their failure to press the claims of science upon the Government. He summed up the position of British scientific men in the following words, contrasting it with instances to the contrary, drawn from foreign countries, and especially from France: 'There is not at this moment, within the British Isles, a single philosopher, however eminent have been his services, who bears the lowest title that is given to the lowest benefactor of the nation, or to the humblest servant of the Crown!' This, it might be said, was an accident almost of the moment, although it was so far true that such names as James Watts, who died in 1819, were allowed to go down to posterity without the adornment of a title. And it might have been supposed that an unaffected demand for such recognition was probably not one which commended itself, then or at any time, to those qualified to bestow it; but the position criticised by Brewster was notably remedied within the one or two decades following the foundation of the Association. Our body in later years directly contributed to this state of affairs: thus Fairburn, in 1861, was offered, but declined, the honour of Knighthood in consideration not only of his work as an engineer, but also of his 'able presidency of the British Association.' This instance is by no means isolated.

To the numerous citizens who are taking an interest in the Hull Meeting, this book will appeal, and we note that it is for sale at Messrs. A. Brown and Sons.

From the preface we gather that the work is largely due to the generosity of Sir Charles Parsons, and we observe that the author is indebted to Mr. T. Sheppard for correcting proofs and making suggestions.

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Camping, the Official Organ of the Camping Club of Great Britain and Ireland, continues to make its welcome appearance, though the Editor appeals for support in the way of contributions, and financially, if the Journal is to keep up its standard.

In recent issues of *Nature*, 'T.S.' does his best to describe the charms of Hull and the East Riding, and the attractions of the forthcoming meeting of the British Association. He hopes that the number attending will exceed that at Edinburgh last year. Optimist!

FIELD NOTES.

BIRDS.

Blackcock in Yorkshire.—On June 7th, while climbing Baugh Fell from the south-east, in company with Mr. C. F. Procter, we disturbed a Blackcock at an elevation of about 800 feet. As it flew down to a lower level I had an excellent view of it through my glasses, and saw that it was in full breeding plumage. We saw no trace of the Grey Hen.—E. WILFRED TAYLOR.

Common Tern at Harrogate in July.—On the evening of July 9th, a cat brought a Common Tern into a house at Starbeck. The bird was in full summer plumage, and appeared to be uninjured in any way. The stomach was empty. Strong north-west winds had been blowing for a day or two, and they had probably blown the bird inland from one of its Lancashire or Cumberland breeding stations.—R. FORTUNE.

Hoopoe in East Yorks.—On May 15th, a Hoopoe visited the premises of B. G. Jalland, Esq., Sutton-on-Hull. It came quite close to the house, showing no fear of man, but apparently its brilliant colours aroused the enmity of the other birds, for one and all mobbed it so incessantly that it flew away into the wood and was not seen again. Let us hope that we may not have to read its obituary notice.—E. W. WADE.

Unusual Nesting Sites for Sand Martins.—Recently, when staying overnight at Huntingdon, I was interested in watching Sand Martins, evidently nesting, flying in and out of the holes made for drainage, in the sides of the Old Bridge. There was quite a number of the birds, and in the absence of any of the typical nesting sites, they had evidently adopted this somewhat unusual habitat. I also noted the largest number of House Martins I have seen for some years, nesting under the eaves of an extensive unused mill or warehouse at one end of the bridge. Numerous Swifts were also nesting in the same building.—R. FORTUNE.

Range of the Fulmar Petrel.—Referring to Mr. E. W. Wade's note in *The Naturalist*, July, 1922, this bird commenced to breed on Rathlin Island, N. Antrim, last year, and has again bred this year. It is now seven or eight years since the first Irish breeding record was obtained, on the cliffs of Mayo and Horn Head. No egg of the Fulmar had been obtained in Ireland until this year, I having recently received a cracked and addled specimen from Rathlin Island. It is rather smaller than the average Fulmar's egg, and I am of the opinion it was laid by either a very young or very old bird—probably the latter. Mr. Wade mentions that he 'found about 25 per cent. of the eggs examined on the outlying stacs of St. Kilda to be addled, as if the birds were getting old and

past laying fertile eggs,' in all probability the birds which are now encroaching on our cliffs are outcasts, or at least are crushed out from the St. Kildan area.—J. A. SIDNEY STENDALL, M.B.O.U.

Birds in immature plumage first frequented the Yorkshire cliffs, and it is probable that it is these birds which upon reaching maturity have nested there.—R.F.

Californian Quail in Salop.—A specimen of the lovely little Californian quail, *Lophortyx californica* was shot on May 12th in the neighbourhood of Bridgnorth, Salop, by Mr. Meredith, of Wooton, who killed it near his house. It was a female, in very good condition, and showing no sign whatever of having escaped from captivity; yet by what natural means could it have reached this country? Possibly some of your readers may know if anybody has tried to introduce this quail? Mr. Kinnear, of the British Museum (Natural History) kindly identified the specimen.—FRANCES PITT.

The fact has been recorded that several of these birds were liberated in the neighbourhood and, no doubt, this example was one of them. The Wild Birds Protection Acts are evidently not observed in this district.—R.F.

Cuckoo's Egg in Nest of Hedge Sparrow.—On the 27th May, two boys took me to the nest of a Hedge Sparrow containing three eggs, out of which a Cuckoo's egg had been taken a few days previously. The egg was of the type usually laid by the Cuckoo in this district. During the last fifty years I have known of only three instances of the Cuckoo's egg having been found in this neighbourhood in the nest of the above species. One of the Cuckoo's eggs I found in the nest of the Hedge Sparrow in early July, 1915, on the edge of Cottingley Wood, was of the blue variety, one of the very few eggs of this kind which have been found in Britain. This I gave to my son Rosse for the Keighley Museum.—E. P. BUTTERFIELD.

It is not unusual to find Cuckoo's eggs in Hedge Sparrows' nests. Hardly a year passes without my finding one. One season I came across three instances at Tanfield; in this case I considered they had been laid by one bird with a special liking for the Hedge Sparrow as a fosterer.—R.F.

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MAMMALS.

Nests of Long-tailed Field Mouse.—This spring I saw two charming nests of the Long-tailed Field Mouse, built amongst the rockery plants in a friend's garden. One was made entirely of the yellow blossoms of polyanthus, and the other of the purple blossoms of arboretum. My friend afterwards found several more nests constructed in a similar manner.—R. FORTUNE.

FISHES.

A Huge Wharfe Trout.—In *The Naturalist* for 1919, p. 150, I gave particulars of two large Wharfe Trout—the larger one of which there were neither weight nor measurements. On May 27th, after a big storm and flood, a huge Trout was found dead on the banks of the Wharfe at Starbotton, near Kettlewell, by the river watcher of the Kilnsey Angling Club, Mr. J. W. Mallinson. He took it to the house of Mr. J. C. Marshall, where it was carefully weighed and measured. It turned the scales at just over 14 lbs., measured 32 inches in length, and 18½ inches at its greatest girth. The fish was quite dry at the time, and possibly may have shrunk a little, both in weight and size. It is amazing how this fish managed to attain such a weight and size in a place where the Wharfe is but a small stream. I think it will hold the record for a long time as the largest Yorkshire river Trout. The weather being hot at the time, the fish began to go bad, and was buried. I hope at some future time to be able to secure a vertebra of it for comparison with the December, 1918, huge Ilkley Trout. Mr. H. E. Dewhirst, President of the Kilnsey Angling Club, has kindly verified the above facts.—H. B. BOOTH, Ben Rhydding.

—: o :—

FUNGI.

Early abundance of Fungi.—During a visit to Strensall Common on July 16th, many fine specimens of *Boletus scaber* Fr. were seen under conifers in a plantation south of the Rifle Butts. Associated with this bolete, also in abundance, was *Amanita rubescens* Fr., and in smaller numbers *Cantharellus aurantiacus* Fr.—F. A. MASON.

----: o :----

E. A. Butler gives a Contribution to the Life History of *Pentatoma rufipes* L., and R. C. L. Perkins 'The British Species of *Halictus* and *Sphecodes* in *The Entomologist's Monthly Magazine* for July.

No. 310 of *The Quarterly Journal of the Geological Society of London* contains 'Structure of the South-west Highlands of Scotland,' by E. B. Bailey; 'Bala Country: its structure and Rock-succession,' by Miss G. L. Elles; 'Lower Palæozoic Rocks of the Llangollen District,' by Dr. L. J. Wills and B. Smith; and 'The Avonian of Broadfield Down,' by F. S. Wallis.

In *The Fellowship Miscellany*, Nos. 4 and 5, the editor, Mr. E. A. Martin, 'earnestly asks members and friends who attend lectures not to leave bags, purses, etc., on the chairs and tables.' He appeals to the members to make good the gaps 'caused by the few who drop out each year when subscriptions become due.' He also wants a book-case. He calls a Carrion Crow an 'avine malefactor and persistent robber of other birds' nests.' These, and other similarly interesting facts, are placed on record in these four-page publications issued by the Gilbert White Fellowship.

NEWS FROM THE MAGAZINES.

G. B. C. Leman gives descriptions of some further new aberrations of *Hippodamia variegata* in *The Entomologist's Record* recently.

W. Mainbridge describes *Blastobasis lignea* Wlsm. (Lep.), a species new to Britain, in *The Entomologist* for July. The record is from Lancashire.

J. H. Orton writes on 'The Mode of Feeding of the Jelly-fish, *Aurelia aurita*, on the Smaller Organisms in the Plankton,' in *Nature* for August 5th.

Mr. G. Granville Clutterbuck was too busy in the spring of 1920 to do much, but he 'realized one of his ambitions' by finding a locality for the Red Helleborine (*Entomologist*, July, 1922.)

Part 19 of *The Outline of Science* contains valuable and well-illustrated papers on the Biology of the Seasons; What Science means for man; Ethnology, and the Story of Domesticated Animals.

E. R. Brown writes on 'Peratological Variations in the Wings of Lepidoptera,' and A. A. Dallman on 'The First Liverpool Flora and its author,' in *The Lancashire and Cheshire Naturalist* for June 26th.

In a note on 'Scotland and the Fur Supply' in *The Scottish Naturalist*, we learn that 'even in the early half of the nineteenth century, as many as 600 skins of the Polecat have been offered for sale at one time at the annual Fur Fair of Dumfries.'

The Antiquaries Journal for July is full of good matter as usual, and includes 'The Hallstatt Period in Ireland,' by E. C. R. Armstrong, and 'Further Discoveries of the Neolithic and Bronze Ages at Peterborough,' by E. T. Leeds. There is also the usual useful summary of recent publications.

Part 17 of *The Outline of Science* (G. Newnes, Ltd., 1s. 2d.), contains a particularly fine coloured plate of 'Precious Stones,' a well illustrated paper on 'The Making of the Earth' (with a photograph of 'A mass of Ammonite Shells' from the Lias at Whitby), and another article on 'The Science of the Sea.'

From the State Museum of the University of Washington we have received some numbers of *The Murrelet*, the official bulletin of the Pacific North-west Bird and Mammal Club, which is an unusual production, inasmuch as the valuable records the publication contains are all produced by means of type-writing, the sheets being tastefully bound together.

The Annotationes Zoologicae Japonenses recently to hand contains a varied quantity of matter, including papers on a New Species of Limnocoelium from Japan; a New Nematode; a case of Conspicuous Sexual Difference in Coloration in Stomatopod; a new Decapod Crustacean; Description of Four New Birds; and Pseudocrangonyx, a New Genus of Subterranean Amphipods.

Messrs. Longmans, Green & Co. have published No. 17 of the *Journal of the East Africa and Uganda Natural History Society*. It contains some plates, is well printed, and among the contents we notice 'Phytophagous Coleoptera of the Family Chrysomelidae,' by A. F. J. Gedye; 'Colour Patterns in *Lycaenidae*,' by V. G. L. van Someren; 'The Wasanye,' by A. M. Champion; 'The Bajun Islands,' by J. T. J. Barton; and 'East African Mammalia,' by A. Loveridge.

British Birds for August states that the first Fulmar's egg was taken on the Bempton Cliffs on May 26th, and that four others have since been obtained. The 'climbers' naively report that they have left four on the ledges, 'as they were fully alive to the fact that the addition of these birds to their ledges was a further inducement to ornithologists to visit them.' It is estimated that there are twenty pairs of Fulmars on the cliffs. The same number includes a fine paper on the 'Migration of British Starlings: Results of the Marking Method,' by A. Landsborough Thomson.

NORTHERN NEWS.

The death is announced of W. H. Hudson, author of many books on natural history subjects.

J. K. Charlesworth, Ph.D., D.Sc. (Leeds), has been appointed Professor of Geology at Belfast.

Dr. Tattersall, of the Manchester Museum, has been appointed Professor of Zoology at the Cardiff University.

Publication No. 78 of the Belfast Museum deals with Old Domestic Ironwork, etc. It contains 16 pages and is sold at 1d.

The Rt. Hon. Lord Ernle writes on 'The Future of British Agriculture' in the *Journal of the Ministry of Agriculture* for August.

'What to see in the Leicester Museum and Art Gallery'—a pamphlet of 16 pages—and sold at one penny, has now reached its sixth edition.

The death is announced of Sir Albert Rollit, a native of Hull, who took a prominent part in scientific matters during the past half century.

The Queen's University of Belfast has conferred the degrees of D.Sc., *Honoris causa*, upon Prof. G. A. J. Cole, J. L. E. Dreyer, and R. L. Praeger.

Mr. E. L. Gill, of the Hancock Museum, Newcastle, has been appointed assistant to Dr. Ritchie, Keeper of the Natural History Department of the Royal Scottish Museum, Edinburgh.

The Boston Society of Natural History (U.S.A.) has published a particularly valuable 'Manual of the Orthoptera of New England,' by A. P. Morse. It contains some remarkably good plates.

The Report of the Colchester Museum Committee for the two years ended 31st March, 1922 (36 pp., 6d.), is a fine record of important local acquisitions, with illustrations of the more important objects.

The death is announced of the Hon. Victor A. H. H. Onslow, at the early age of 32. His lower limbs were paralysed as a result of a diving accident in 1911, since when he devoted himself to the study of variation and mendelism.

As Hull Museum Publication, No. 130, is issued 'The Hull Municipal Museum of Natural History, Antiquities and Applied Art: Its History and Collections,' by T. Sheppard, M.Sc. It contains twelve pages, and is sold at one penny.

We have received from M. Charles Janet, *Considérations sur L'être Vivant, Résumé Préliminaire de la constitution de L'orthobionte, Part I. and L'Individu, la Sexualité, la Parthénogénèse et la Mort, au point de vue orthobiontique, Part II.*

Phyllis E. Pease has issued a charming pamphlet, *The Legend of Paradise* and other poems (A. Brown & Sons, 38 pp., 2s. 6d.); *Paradise* being the name given to an East Yorkshire coppice. There are poems on Geese, the Yorkshire Wolds, Sunset among the Trees, A Thunderstorm, October, and Christmas.

L. S. Palmer gives a fearful and wonderful 'imaginary section, illustrating man's relation to the Ice Age in Hampshire.' The first column, headed 'Climatic Period,' contains the following: 'Recent Daun? Gszhnitz? Bühl, Achen, Würm, Riss-würm, Riss, Mindel-riss, Mindel, Gunz-mindel? Pliocene.' All this in Hampshire!

Among the Civil Service Pensions recently awarded, we notice:—Lady Fletcher, in recognition of the services rendered by her late husband (Sir Lazarus Fletcher) to science, £60; Mrs. J. M. Miller, services by her late husband (Dr. N. H. J. Miller) to agricultural science, £50; Mrs. Alice Mabel Usher, services by her late husband (Mr. W. A. E. Usher) to geographical science, £30; Mrs. Agnes E. Walker, services by her late husband (Mr. George W. Walker, F.R.S.) to science, £75; the Misses Ellen C., Gertrude M., Alice B., Katherine E., and Mary Woodward, services by their late father (Dr. Henry Woodward, F.R.S.) to geological science, £125.

The Annual Report of the Scottish Marine Biological Station for 1920 contains 'Faunistic Notes and New Records,' and 'Notes on the Food of the Cod,' by Richard Elmhirst.

The Report of the Plymouth Municipal Museum and Art Gallery on the work done at the Museum from April, 1908, to March, 1922, is a particularly readable pamphlet, and explains the various directions in which the museum's activities have found vent.

Part 3 of Vol. XXXIII. of *The Proceedings of the Geologists' Association* contains the Presidential Address of W. Whitaker, F.R.S., on 'Hjnts.'; 'The Graptolite Fauna of the British Isles: A Study in Evolution,' by Dr. Gertrude L. Elles; and 'The Geological Structure of the country around Combe Martin, North Devon,' by Dr. J. W. Evans.

The British Museum (Natural History) has recently issued the Tenth Edition of its *Guide to the Fossil Reptiles, Amphibians, and Fishes in the Department of Geology and Palæontology* (112 pp., 8 plates, and 117 text-figures, 2s.), and the Second Edition of its *Guide to the Specimens of the Horse Family (Equidae) exhibited in The Department of Zoology* (44 pp., 26 figures, 1s.)

The ninety-ninth *Report of the Whitby Literary and Philosophical Society* (34 pp.) contains some valuable local natural history notes (birds and fishes). 'The Rise and Fall of the Jet Tradé,' by T. H. Woodwark, and 'Whitby Churchyard,' by Chancellor Austen, from which we learn that one epitaph reads, 'She had two bad legs and a baddish cough; but her legs it was as carried her off.'

We have received from Erland Nordenskiöld 'Ethno-geographical analysis of the material culture of two Indian tribes in the Gran Chaco,' which contains 300 pages with illustrations, the whole memoir being printed in English. It is a translation of the edition published in 1918, and has been prepared at the expense of Consul-General Axel Johnson, the Managing Director of the Steamship Line which bears his name.

From Messrs. Macmillan & Co., we have received Vol. I. of *Empire Forestry*, the Journal of the Empire Forestry Association, Imperial Institute, London. (126 pp., 4s.) The publication contains contributions dealing with various aspects of the subject, the articles being as varied as Forestry in the Empire; Western Australia as a Producer of Fine Timber; Forest Fires in Canada; Timber Testing in India; Sylvicultural Treatment of Eucalypts; The Australian Forest League; The Douglas Fir Flagstaff at Kew; and Tree-Worship in India. This new publication is welcome.

The following extract from the Annual Report of the Royal United Service Institution, Whitehall, is worth repeating 'At the anniversary meeting the chairman of the Museum Committee, Commander Caborne, said that, when the Imperial War Museum was started, it was suggested that the museum of the Institution should form part of it; the Council never considered the proposal seriously or thought of leaving its home in the Palace of Whitehall. The Council was, however, strongly in favour of taking over and incorporating the Imperial War Museum if a new building had been provided, specially designed to meet all the requirements of the case.'

In the daily press Mr. E. A. Martin makes the brilliant suggestion to 'those who have heavy books on their shelves. Such books should be turned upside-down frequently, and as far as possible for periods equal to those during which they stand the right way up. Heavy books, when always standing on one end, have a tendency to tear away from their binding at the top. This is because the covers are usually larger than the size of the pages. By alternating their positions the wear is equally distributed between the top and the bottom of the back of books. We would suggest that he brings his idea forward to, say, the Geological Society of London—of which he is a Fellow.

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A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Aug.-Sept., 1922.

50642

OCT., 1922.

No. 789
No. 563 of current Series

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

T. W. WOODHEAD, Ph.D., M.Sc., F.L.S.,
Technical College, Huddersfield,

WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

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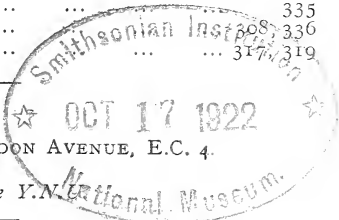
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YORKSHIRE NATURALISTS' UNION:

BOTANICAL SECTION.

ANNUAL MEETING in the Leeds University, October 7th, 3-30 p.m.

BUSINESS.—Discussion of Reports and Suggestions for the election of Officers and Committees. After tea, papers will be read. Prof. PRIESTLEY will show some of his work in connection with Peat plants, and Dr. PEARSALL will explain Salt ratios (see *The Naturalist*, September). Mr. W. H. BURRELL has a note on the V. C. boundaries. Other papers will be welcome.

CHRIS. A. CHEETHAM.

GEOLOGICAL SECTION.

President: Prof. A. GILLIGAN.

THE ANNUAL MEETING of the Section will be held in the Museum, Belle Vue, Halifax, on Saturday, October 14th, at 7 p.m. Members and Associates are invited to bring notes, specimens, etc., and to take part in the discussions.

A FIELD EXCURSION will be arranged for the afternoon. Meet at the Post Office at 2 p.m. If the weather be unfavourable the geological collection at Belle Vue will be examined.

JOHN HOLMES (*Hon. Sec.*),

Crosshills, nr. Keighley.

ANNUAL MEETING OF THE ENTOMOLOGICAL SECTION.

President: G. T. PORRITT, F.L.S., F.E.S.

Two Meetings will be held in the LIBRARY OF THE Y.M.C.A., ALBION PLACE, LEEDS, on SATURDAY, OCTOBER 28TH, 1922, at 3-15 p.m., to consider and pass the Sectional Reports, and to elect Officers for 1923; and at 6 p.m., at which entomological topics will be discussed. Exhibits of all orders of insects are requested. Members and Associates of the Union are cordially invited. Notes and records made during the session on entomological subjects in the county are solicited, and these should be **in the Secretaries' hands by October 1st**, for inclusion in the Annual Report of the Union.

Secretaries:—Lepidoptera, B. MORLEY, Skelmanthorpe; Hymenoptera, ROSSE BUTTERFIELD, Keighley; Diptera, C. A. CHEETHAM, Wortley, Leeds; Coleoptera and Hemiptera, W. J. FORDHAM, Newcastle; Neuroptera and Trichoptera, G. T. PORRITT, Huddersfield; Galls, W. FALCONER, Slaithwaite.

B. MORLEY (*Sectional Secretary*), Skelmanthorpe.

VERTEBRATE SECTION.

President of the Section: S. H. SMITH, York.

Two Meetings will be held in the Library of the Leeds Philosophical Society, Park Row, Leeds, at 3-15 p.m. and 6-30 p.m. respectively, on Saturday, October 28th, 1922.

BUSINESS AT THE AFTERNOON MEETING.—(a) To consider and pass Sectional Reports for 1922, and to elect Officers for 1923; (b) The General and Financial Reports of the Yorkshire Wild Birds and Eggs Protection Acts Committee for 1922, and to elect Officers and Committee for 1923; (c) The Report of the Yorkshire Mammals, Amphibians, Reptiles and Fishes Committee for 1922, and to elect this Committee for 1923.

The following PAPERS will be given:—'The Changing Status of the Tern Colonies in the Farne Islands,' H. B. Booth, F.Z.S., M.B.O.U.; 'Field Notes,' W. H. Parkin.

At the Evening Meeting the following PAPERS will be given, with lantern slides:—'Early Man,' C. F. Proctor; 'Notes on Bird Life,' T. M. Fowler.

Any Member or Associate of the Yorkshire Naturalists' Union is invited to attend, and bring notes, specimens, lantern slides, etc. Will Officials of Affiliated Societies kindly notify their members?

E. WILFRED TAYLOR (*Hon. Sec.*);

10 Telford Terrace, York.

NOTES AND COMMENTS.

'NATURE' AND THE BRITISH ASSOCIATION.

Our time has been rather more fully occupied than usual, otherwise the present issue would have had a more complete account of the British Association meeting at Hull. In the meantime, we feel pleased to have the following compliment paid by *Nature* :—'Yorkshire hospitality is proverbial, and it has been very pleasantly manifested during the meeting of the British Association just concluded at Hull. The citizens have in many ways shown themselves to be proud to entertain the Association, and the facilities they have offered to the members have been exceptionally helpful. Each member was provided with a badge, and this was not only a free pass on the quick and convenient tramway system of the city, but also secured personal guidance and interest from citizens in the streets or in vehicles of any kind. It would be impossible for a city to show greater interest in its visitors, or to do more to make their sojourn pleasant, and the many attentions have been much appreciated, particularly by officers, and other active members of sections, who usually have not the time to search for all the amenities which a place of meeting may afford. A number of free luncheons have been provided, and when the day's meetings have been over, tea has been served in the writing-room of the Guildhall, and has been found most grateful and comforting to the members. For these and other unusual attentions the Association is no doubt chiefly indebted to the local secretary, Mr. T. Sheppard, curator of the Hull Museums, but with him is associated the Town Clerk, Mr. H. A. Learoyd, and the generous hospitality would not have been possible without the active interest and support afforded by the Corporation and the people of the city. "The Handbook to Hull and the East Riding of Yorkshire," edited by Mr. Sheppard, and presented to each member, is a volume of permanent value.'

YORKSHIRE NATURALISTS' UNION EXHIBITION.

As announced last month, a Sub-Committee of the Union organised an Exhibition illustrative of the regional work in Natural History conducted by the various Committees of Research. The Exhibition was held in the Board Room of the Hull Education Office, and was a great success in every way. On Friday, September 8th, the President, Dr. T. W. Woodhead, held an 'At Home' at the Exhibition, at which two hundred delegates of the British Association attended as guests of the Yorkshire Naturalists' Union. It is impossible to give even a brief summary of the very numerous exhibits, but readers will be interested to know that a handbook of

thirty-one pages descriptive of the Exhibition was published, and every visitor received a copy. It is the first time that a show so complete has been held in connexion with the British Association; and it is interesting to note that the Council of the British Association passed a resolution expressing the wish that similar regional Natural History Exhibitions be held in the future meeting places of the Association.

YORKSHIRE PHILOSOPHICAL SOCIETY.

On the 20th September, the Yorkshire Philosophical Society celebrated its Centenary in a gorgeous and dignified manner. The President, Mr. W. H. St. Quintin, welcomed the delegates and guests in the Tempest Anderson Hall; and congratulatory addresses were handed in by the representatives of the various learned and scientific societies throughout the country. The meeting was addressed by the Lord Mayor of York, and a procession was formed from the Museum to York Minister, where the Lord Bishop of Beverley gave an address. The delegates were entertained to dinner in the De Grey Rooms, and in the evening there was a *conversazione* at the Museum, where short addresses were given by local gentlemen.

SOCIETIES REPRESENTED.

There were several special exhibits arranged, the weather proved to be particularly favourable, refreshments were provided in a marquee in the grounds; and in every way things went with a swing, largely through the organisation of the Curator, Dr. Collinge. The following societies, museums, etc., were represented, and presented addresses:—The British Association for the Advancement of Science; The Royal Society of London; The Royal Society of Edinburgh; The University of Leeds; The University of Sheffield; The Linnean Society of London; The Zoological Society of London; The Geological Society; The Society of Antiquaries of London; The Society of Antiquaries of Scotland; The Royal Institute of British Architects; The British Museum; The British Museum (Natural History); The Victoria and Albert Museum; The Royal Meteorological Society; The Museums Association; The Yorkshire Archæological Society; The Yorkshire Geological Society; The Barnsley Naturalists' and Scientific Society; The Cambridge Philosophical Society; The Hull Literary and Philosophical Society; The Leeds Philosophical and Literary Society; The Scarborough Philosophical and Archæological Society; The Sheffield Literary and Philosophical Society; The Thoresby Society; The Natural History Society of Northumberland, etc.; The Yorkshire Architectural and York Archæological

Society; The Doncaster Museum; The Hull Municipal Museums; The Leeds Museum; The Conchological Society of Great Britain and Ireland; The Leeds Library.

KAMES.

In some rambling 'Notes on the Brandesburton Kame, Yorkshire,' (*Geological Magazine*), James Phemister tells us that "'George" pennies, 232 years old have been found by workmen in the excavations, indicating that the hill was probably dug for gravel in the *Eighteenth Century*.' Mr. Phemister's knowledge of history equals his knowledge of geology. What possible service are the photographs reproduced on the accompanying plate, it is difficult to imagine, except that the blockmaker has benefitted.

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FIELD NOTES.

ENTOMOLOGY.

Sphinx convolvuli in N. Yorks.—On the 6th inst. I saw a rather battered male specimen, which had been caught near Snainton (N. Yorks.) the previous day.—W. H. ST. QUINTIN.

(P.S.—During the week following the 6th, another *S. convolvuli* was picked up dead in the garden at Headon Lodge, Snainton; while a third specimen was seen at some tobacco plants, in broad daylight, but was not taken.)

Recently, Mr. T. S. Mosley showed me a specimen of *S. convolvuli* which had been taken at Meltham, Huddersfield, about the same time as the one recorded by Mr. St. Quintin, and brought to the Tolson Memorial Museum.—G.T.P.

Hemerobius concinnus at Everingham.—Recently Mr. H. Maxwell Stuart kindly sent me some specimens of Neuroptera which he had taken during July last, at Everingham, York. Among them I was pleased to see four examples of *Hemerobius concinnus*, of which we had previously only two records for Yorkshire, both single specimens at Sandburn and Skipwith respectively. With them was also a specimen of the closely allied *Hemerobius quadrifasciatus*, but it we knew to be widely distributed, though local in the county. From the same locality the Rev. Cyril Ash sent me a couple of specimens of *Chrysopa phyllochroma*, which he took there on July 12th last; this we previously only knew in the county from Thorne and Skipwith.—GEO. T. PORRITT, Dalton, Huddersfield, September 11th, 1922.

Diurnal Lepidoptera from Allerthorpe Common.—On Allerthorpe Common, East Yorks., on August 14th, I captured a male Clouded Yellow Butterfly (*Colias croceus* Fourc.) in

good condition in the road leading from Barmby Moor to Sutton, a few hundred yards from the outskirts of the Common. The insect had just risen from the roadside herbage, and was captured before it had developed its usual strong flight. The day was overcast with occasional glimpses of sunshine, and a moderate westerly breeze. Altogether, thirteen species of butterflies were taken within a few hours. The 'Skippers,' *Adopaea flava* Brunn and *Augiades sylvanus* Esp., were not uncommon on a grassy part of the common, settling on Ragwort, Thistles and Scabious in company with the Small Copper (*Chrysophanus phlaeas* L.) and the Blue (*Polyommatus icarus* Rott.). The Meadow Brown (*Epinephele jurtina* L.) was abundant, but much worn, and several Small Heaths (*Coenonympha pamphilus* L.) also occurred in several places. The three common 'Whites' were in great force; the Green-veined (*Pieris napi* L.) being, if anything, the most frequent. Several Dark Green Fritillaries (*Argynnis aglaia* L.) were seen among the brambles, and two worn specimens captured. The Red Admiral (*Pyrameis atalanta* L.) and Small Tortoiseshell (*Aglais urticae* L.) complete the 'baker's dozen.' In addition to the above species, the Dingy Skipper (*Nisionades tages* L.) was plentiful earlier in the year.—W. J. FORDHAM.

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FLOWERING PLANT.

Teratology of Corolla of Foxglove at Kebroyd.—When on my holidays this summer in the ever pleasant and picturesque Ryburn Valley, where the scenery is both rich and varied, and possesses characteristics of grace and beauty; pleasantly strolling up the hillside to Kebroyd Hall, I enjoyed a ramble in the wood crowning the brow or scar behind the house. Paths wind here and there under overhanging trees, and there are rocky recesses covered with rock plants and ferns. Presently coming to an opening, a large group of foxgloves produced a striking feature in the woodland. On close examination, the terminal flower of one of the group was found to be a large 'synanthic' flower, with an erect bell-shaped tube. It was made up of thirteen lobes, with a symmetrical border, and measured fully $2\frac{3}{4}$ inches across. Its floor was light in colour, and covered with beautiful 'eyespot's of red and lemon. The plant on which it was growing was only of medium height, being but 2 feet 10 inches, and it had a row of nineteen flowers of the usual thimble-shaped or digitaliform corollas.—JOE FIRTH, Liverpool.

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In the 700th issue of *The Entomologist's Monthly Magazine* were described two species of coleoptera new to the British list; two sawflies new to Britain; and a grasshopper new to Britain: not a bad 'bag.'

A FLOURISHING ULSTER FIELD CLUB.

R. J. W.

We have so many friends among the readers of your Magazine in Yorkshire, Lancashire and Nottinghamshire that I think this screed might interest them. We are going as strong in the Belfast Naturalists' Field Club as we were when Praeger was Secretary many years ago. I am afraid many English Field Clubs are not very flourishing. I suppose they have served their day and generation with you. They certainly *have not* here in Ireland, and I trust, when the Southern irregularities and mimic (and tragic, too, alas!) war is over, that the Dublin and Cork Clubs will do well again. Limerick Club is defunct, and some of its best men dead.

It was really no joke carrying out B.N.F.C. excursions as things were. We had to drop one excursion this season. No owner would send a really good motor with us, as it meant going through a *very* bad area in a mountainous country, where we might have been held up and the char-a-banc burned. In the one I conducted in May, I had to take my party past the end of the worst sniping street in Belfast, my only route, too, past the very corner where men were killed almost daily for a time, and where the military cut off the street at times with barbed wire barricades (as they have another main street near me for the past three weeks). Fortunately that state of affairs has nearly passed away in Belfast.

In view of the present state of Ireland, many members of English field clubs who have, in days gone by, joined the Belfast Naturalists' Field Club in their excursions, may be glad to have some news of that Club, and its sister Society, the Belfast Natural History and Philosophical Society. Many of our readers may have thought that the political situation in Ireland would almost lead to an extinction of intellectual activity on the part of Natural History or Archæological Societies. That this is not the case, so far as the Belfast Naturalists' Field Club is concerned, many old friends of that Society in English Field Clubs will be glad to hear. If the Club had gone down in membership and general activity, owing to the difficulties caused by the war, and later by dangers of travel caused by the blowing up of trains and railway bridges, sniping, *i.e.*, by the Republican irregulars, no one would have been surprised. Some English clubs have decreased in membership for lesser causes; but the reverse is the case with the Belfast Club; it has gone up, and very much up. The membership is now about 460, 180 of whom in the Senior Section were elected in fourteen months ending May last. Of these 167 were obtained by the Hon. Treasurer, Mr. T. E. Osborne, alone, while an old ex-president proposed 11 members for the Junior Section at one meeting this summer.

In pre-war times, railways were the usual method of travel, with wagonettes for short excursions round Belfast. Now, owing to the perfection of motor transit, many of the long (full day) excursions are made in motor chars-a-banc, two this summer in this way being most successful, the first over the Belfast Hills to the shores of Lough Neagh at Langford Lodge—the party examined, of course, for arms, ammunition or seditious papers at the Special Police barriers both going and coming home—a very formal examination only of the driver's credentials in the case of the B.N.F.C., although a very strict personal one in the case of many other excursion parties. Some of the members were anxious that one of the party should be searched on the return journey, and informed the police so, as they knew he had besides two boxes of 'ammunition'—young cones of *Cupressus*—a big tin box of *Limax maximus* var. and one of *Bithynia*, which would have astonished the searchers. The second journey was to the Mourne Mountains, right across the Co. Down. Several other excursion parties had to pass through or very close to 'sniping' areas in Belfast, on way out or home, but did not allow that fact to interfere with their enjoyment of a day's collecting on good ground. The Society is, of course, strictly non-sectarian and non-political, and has members of all denominations in its ranks. The Belfast Natural History and Philosophical Society, too, has quietly continued its work, including many public scientific lectures; its Archæological Section explored, in war time, the ground round the Giant's Ring Dolmen, (always called Cromlechs in Ireland), which stands in the centre of a great Lis on a hill-top, and at present has almost completed, at a cost of over £400, the digging out from under great heaps of debris, of the early Celtic monastic buildings of Nendrum, including the remains of the round tower and a number of crosses, etc. Nendrum will be fully illustrated, so the Editor writes in *The Graphic*. This monastery, on Mahee Island, Strangford Lough, was founded by the Celtic Abbot Mahee about 1450. Nendrum was a famous school, and here were educated St. Finian, the founder of Movilla, and St. Colman, founder of Dromore. The place seems to have been destroyed by the Norse freebooters in or about A.D. 974. The remains of the Church, Round Tower and stone-lined graves stand inside the inner of three dry built cashels. This has been repaired, and it is proposed to repair most of the two outer also. It is the most important piece of conservation of what should be a national memorial that has taken place in Ulster for very many years. The pages of your contemporary, *The Irish Naturalist*, show that the naturalists of both Societies still continue as active as ever they were, and seem to look on the present troubles in Ireland as merely rendering life interesting!

JURASSIC HISTORY.

A. M. DAVIES.

IN the July number we noted the appearance of Part XXXII. of Mr. S. S. Buckman's *Type Ammonites*, in which some Yorkshire species were figured. Three more parts have since appeared, one of which (Part XXXIV.) contains a contribution to the subject of Jurassic chronology that should be read by everyone interested in the reconstruction of the conditions and events of past geological periods.

Mr. Buckman's work is so often misunderstood, that it may not be out of place to point out that his ideas are fundamentally those of William Smith, only applied with greater precision. The new ideas with which he himself has supplemented them are principally three. Firstly, that of homœomorphy, or the close superficial resemblance of species of diverse origin and often distinct age, which makes hasty field determination dangerous. Secondly, the idea that the sediment accumulated in any area during a given time is an algebraic sum of deposition and erosion, an idea which invalidates much easy correlation based on the notion that beds in two areas must be synchronous because the beds above or below them (or both) are synchronous. Thirdly, the distinction (in the case of ammonites) between drifted shells and shells buried in their natural habitat, a distinction of vital importance in any attempt at recognizing ancient life-provinces. While fully admitting that such provinces can sometimes be defined, Mr. Buckman argues that many apparent cases are due to the mistake of taking faunas as synchronous which are not. His actual suggestions of Jurassic geography will be found in Part XXXIV. He also gives a provisional tabulation of the Jurassic period, dividing it into 43 ages, each characterized by the dominance of some one Ammonite genus after which it is named (each age is in turn composed of a number of hemeræ, but these are not now dealt with; they have been partially tabulated in earlier parts).

Two questions naturally suggest themselves. Firstly, was the Jurassic a typical or an exceptional period in the earth's history? In estimates of geological time based on thicknesses of strata we generally notice that the Jurassic system appears very thin for its admitted importance. These estimated thicknesses do not make the allowance that Mr. Buckman insists upon for unequal accumulation and quasi-contemporaneous erosion: his own estimates of maximum thickness would be many times larger. But do all systems require the same factor of enlargement? Seeing that the most fully

studied areas were, in Jurassic times, occupied by shallow seas and subject to gentle posthumous folding movements, it is at least possible that contemporaneous erosion played a bigger part in the Jurassic period than in others.

Secondly, it is often asked, whether these important general conclusions could not be reached without the breaking-up of the old genera and species of ammonites to the extent that is done in *Type Ammonites*? It may be doubted whether Mr. Buckman divides up ammonites really to a greater extent than the French palæontologists have divided up Tertiary gastropods, for instance. But the latter have made matters easier for the weaker brethren by the device of intercalating sub-genera and sections between the old genera and species, while Mr. Buckman is rigidly Linnæan. The French method would, however, be unworkable or seriously misleading in the separation of homœomorphs, and in any case since Mr. Buckman has undertaken the difficult task of sorting out and distinguishing what look so much alike to us, we must allow him to decide what is the most suitable nomenclature.

We can therefore congratulate him on the patient persistence with which he continues his labours in the face of many difficulties, and hope that he may long be able to continue at work.

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The death is announced of Dr. David Sharp, F.R.S., the entomologist.

The Times for September 18th offers for sale 'A Lifetime Collection of shells (*male and female*) from all parts of the world.'

Mr. J. F. Musham's extensive collection of Non-Marine Mollusca relating to Lincolnshire has been presented to the Museum at Lincoln; his unrivalled collection of coin-weights has been sent to Hull.

Mr. W. H. Edwards has written a 'Short Illustrated Guide to the Beale Memorial Collection of Nesting Groups of British Birds in the Birmingham Museum' (40 pp., 3d.). The illustrations are good, but we don't like the advertisements.

We regret to find that our contributor, Mr. J. F. Musham, is leaving Yorkshire, and for the present is taking up his residence near Windermere; though we have reason to believe that he will constantly keep in touch with the workers of the county.

At a sale of machinery at Stainland recently, the nest of a thrush, containing four young birds, was found in one of the looms. The auctioneer offered the loom for sale, including the nest and the young birds. Until quite recently the loom was in operation along with others in the same shed.

As sea serpents and giant gooseberries are getting a little out of date, the press apparently has to fly to 'early man' (and woman) for its thrills. The following appeared quite recently:—'Bones dredged from the bed of the River Cam, at Upware, Cambridgeshire, are stated to be those of a prehistoric woman. It is supposed she was a tree climber, whose home would be a rudely built platform in the trees, and whose mode of travel would be that of swinging herself from bough to bough. At one time the whole district was one vast oak forest.'

KELDWITH HEPATICS.

WM. HY. PEARSON.

BEING the guest of my friend William Dodd, Esq., of Keldwith, Windermere, for a week-end, I took the opportunity of trying to re-discover the rare *Liochlaena lanceolata* (Schrad.) Dum., which the late George Stabler found in the immediate vicinity, as recorded in *The Naturalist* in his 'List of the Mosses and Hepaticæ of Westmorland.' Although I searched very diligently, I regret I was unable to meet with it.

Keldwith is very picturesquely situated about 200 feet above "Wooded Winandermere, the river lake," with a view of almost the whole length of the Lake, and in the distance the range of mountain peaks from Doe Crag on the extreme left, with Coniston Old Man, Wetherlam, Crinkle Crags, Scafell, Bow Fell, Great End, Allan Crag and Glaramara on the right, making one of the finest views in the Lake District; but being on Botany bent, I had to 'turn my clownish back to the glory of the sky,' as Browning says; and behind the house found an abundance of *Lunularia cruciata*, and on the numerous rills which flow through the grounds, found on their banks rich tufts of the rare and beautiful *Hookeria lucens*; but on the rocks in a considerable stream which flows near the house, and comes from the fells about Orrest Head, I found some very interesting species, the most important being *Scapania intermedia* (Husnot), growing on a rock in the stream in small tufts.

Although Macvicar says, in his 'Handbook of the British Hepaticæ,' that it is a somewhat doubtful species, yet its small size, light glistening colour, habit of growth, just like *Scapania umbrosa*, for which I mistook it at first, it appears to be quite distinct from *Scapania dentata*; but when microscopically examined, although so small, with perfectly developed male and female stems, its near approach to this species justifies Mr. Macvicar in his opinion. My other good find was an abundance of *Madotheca rivularis* Nees, which clothed the rocks almost to the exclusion of other species.

On the same wet rocks I met with a few stems of *Haplozia pumila* (With.) K. Müll.; its paroicous inflorescence separates it at once from the commoner *H. riparia* (Tayl.); the Keldwith specimens are rather larger than the Alpine form, which has also a narrower perianth, it is also distinct from the paroicous *H. rivularis* of Schiffner, which is found on wet shaley rocks and has broader leaves, with shorter and broader perianths, which differences are noticeable in the field, as only recently I have had the pleasure of seeing the latter growing at Delph, where it had been found by Mr. H. C.

Broome, the discoverer of *H. caespiticia* (Lindenb.) in the north of England.

Another species which I met with is a form of *Plagiochila spinulosa* (Dicks.). Although very different from the usual type, I have come to the opinion that it is only a more delicate variety of this somewhat variable species.

The other species, of which I add a list, give some indication of what might be found on such a delightful spot as Keldwith.

<i>Conocephalum conicum</i> (L.) Dum.	<i>P. spinulosa</i> (Dicks.) Dum. var.
<i>Lunularia cruciata</i> (L.) Dum.	<i>Lophocolea cuspidata</i> Limpr.
<i>Mezgeria conjugata</i> Lindb.	<i>L. heterophylla</i> (Schrad.) Corda.
<i>Pellia epiphylla</i> (L.) Corda.	<i>Chiloscyphus polyanthus</i> (L.) Corda.
<i>Haplozia pumila</i> (With.) K. Müll.	<i>Diplophyllum albicans</i> (L.) Dum.
<i>Lophozia Lyoni</i> (Tayl.).	<i>Scapania nemorosa</i> (L.) Dum.
<i>Plagiochila asplenioides</i> (L.)	<i>S. intermedia</i> (Husnot) Pearson.
var. <i>major</i> .	<i>Madotheca platyphylla</i> (L.) Dum.
<i>P. asplenioides</i> (L.)	<i>M. rivularis</i> Nees.
var. <i>humilis</i> Lindenb.	<i>Lejeunea cavifolia</i> (Ehrh.) Lindb.
	<i>Frullania Tamarisci</i> (L.) Dum.

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Bonito captured at Whitby.—On August 22nd, a Bonito twenty inches in length and weighing about four pounds was captured, and brought into Whitby by the local salmon fishing coble 'Ellen Ann.'—J. H. WILSON.

Mr. Wilson tells me he has no doubt whatever as to the identity of the fish, and as he preserved the skin of the only other example which has been landed here, he is well able to judge. This occurrence was in the year 1882, and the specimen is in the Museum at Whitby.—F. SNOWDON.

More Plant Galls from the Leeds District.—Approaching Adel from Chapel Allerton, and leaving it *via* Weetwood, the following forms additional to those given in *The Naturalist*, August and December, 1921, were observed on September 16th last. In Stanebeck Lane—on the slope, HYM., *Isosoma graminicola* Gir. on couch grass: near the crossing of Stonegate Lane, DIP., *Contarinia tiliarum* Kieff. on broad-leaved limes (old); and HOM., *Pemphigus affinis* Kalt. on Lombardy poplar. Near Scotland Mills—DIP., *Perrisia loticola* Rubs. on *Lotus uliginosus* (also near the Seven Arches); *P. fraxini* and *P. fraxinea* Kieff. on ash; *Trypeta reticulata* on *Hieracium boreale*; HOM., *Brachycolus stellariae* Hdy. on *Holcus mollis*; FUN., *Exoascus alnitorquus* Wint. on alder leaves; *Urocystis anemones* Pers. on creeping buttercup. Near the Seven Arches—HYM., *Dryophanta disticha* Htg. on oak. At Weetwood, HYM., *Pontania salicis* Christy on *Salix* sp. bordering a wall on right hand side near the cross roads, and HOM., *Schizoneura ulmi* Linn. on elm.—W. FALCONER, F.E.S.

DIPTERA FROM WENSLEYDALE.

CHRIS. A. CHEETHAM.

DIPTERA records are few from V.C. 65, the North-west Yorks. vice county, and the occasion of the Botanical Sectional Meeting at Middleham was used to collect such flies as could be found. The weather was by no means ideal for this pursuit, but the effort appears justified by the result. Six species are additions to the list of the county as a whole:—*Boletina plana* Wlk., *Polylepta undulata* Winn., *Platyura zonata* Ztt. (*concosa* Wlk.), *Molophilus cinereifrons* Meij., *Xanthochlorus ornatus* Hal. and *Neurigona suturalis* Flin. The last named was not represented in the British Museum collection, and a pair of Yorkshire specimens now fill the gap. The following have not been recorded previously for the vice county.

<i>Mycetophila lineola</i> Mg.	<i>Tachydromia agilis</i> Mg.
<i>Allodia lugens</i> Wied. (<i>ornaticollis</i> Mg.)	<i>T. flavicornis</i> Mg.
<i>Boletina trivittata</i> Mg.	<i>Dolichopus discifer</i> Stan.
<i>Mycomyia punctata</i> Mg. (<i>Sciophila</i>)	<i>D. brevipennis</i> Mg.
<i>Macrocera centralis</i> Mg.	<i>D. unguatus</i> L. (<i>aeneus</i> Deg.)
<i>M. angulata</i> Mg.	<i>Lianculus virens</i> Scop.
<i>M. stigma</i> Curt.	<i>Lonchoptera tristis</i> Mg.
<i>Dilophus femoratus</i> Mg. (<i>albipennis</i> Mg.)	<i>Pipunculus campestris</i> Ltr.
<i>Bibio clavipes</i> Mg.	<i>Chrysogaster hirtella</i> Lw.
<i>Ptychoptera contaminata</i> L.	<i>Platychirus manicatus</i> Mg.
<i>Limnobia flavipes</i> F.	<i>P. albimanus</i> F.
<i>L. tripunctata</i> F.	<i>Melanostoma scalare</i> F.
<i>L. macrostigma</i> Schum.	<i>Sphæophoria menthastri</i> L.
<i>Ormosia nodulosa</i> (Mcq.) Meij. (<i>Rhypholopus</i>).	<i>Onesia sepulchralis</i> L.
<i>Limnophila ochracea</i> Mg.	<i>Sarcophaga carnaria</i> L.
<i>L. discicollis</i> Mg.	<i>Allæstylus diaphanus</i> Wied. (<i>flaveolus</i> Mg.)
<i>L. nemoralis</i> Mg.	<i>Mydæa pagana</i> F.
<i>Tipula lateralis</i> Mg.	<i>Hylemyia nigrimana</i> Mg.
<i>Rhyphus punctatus</i> F.	<i>Parallelomma albipes</i> Flin.
<i>Sargus flavipes</i> Mg.	<i>Scatophaga suilla</i> F.
<i>Microchrysa polita</i> L.	<i>Helomyza lavifrons</i> Lw.
<i>Beris chalybeata</i> Forst.	<i>Dryomyza decrepita</i> Ztt.
<i>Chrysopilus auratus</i> F.	<i>Psila nigricornis</i> Mg.
<i>Symphoromyia crassicornis</i> Pz.	<i>P. nigra</i> Flin.
<i>Rhamphomyia dentipes</i> Ztt.	<i>Palloptera umbellatarum</i> F.
<i>Empis stercorea</i> L.	<i>Sapromyza decempunctata</i> Flin.
<i>E. tessellata</i> F.	<i>S. præusta</i> Flin.
<i>E. livida</i> L.	<i>S. rorida</i> Flin.
<i>E. bilineata</i> Lw.	<i>Lauxania aenia</i> Flin.
<i>E. pennipes</i> L.	<i>Opomyza germinationis</i> L.
<i>Hilara maura</i> F.	<i>Sepsis cynipsea</i> L.
<i>Ocydromia glabricula</i> Flin.	<i>Nemopoda cylindrica</i> F.
<i>Argyria leucocephala</i> Mg.	<i>Agromyza flaveola</i> Flin.
	<i>Chloropisca notata</i> Mg.

I am indebted to Mr. F. W. Edwards for help in naming the Nematocera in the additions to the County list.

YORKSHIRE NATURALISTS AT FILEY.

W. H. PEARSALL, D.Sc., F.L.S., AND F. A. MASON, F.R.M.S.

ONCE in each decade of the last 50 years, Filey has been visited by the Yorkshire Naturalists' Union, viz., in June, 1883; Sept., 1895; May, 1903; May, 1914; and on July 15th of the present year. Sometimes the programme has provided for the investigation of the district north of the Bay, while at other times the country to the south has been examined. These excursions have resulted in a very complete knowledge of the natural history of this physiographically well-favoured and increasingly popular health resort. Valuable records are contained in *The Naturalist*, 1903, pp. 241-251, and 1914, pp. 221-5 and 253-6. Other important papers bearing on this district are, 'Marine Zoology at Filey,' T. Petch, *The Naturalist*, 1903, p. 351-2; 'The Vegetation of Ponds at Filey,' W. G. Smith, *tom. cit.*, pp. 389-396, and 'The Early History of Filey,' T. Sheppard, *The Naturalist*, 1914, pp. 269-273.



'Flat Cliff,' Primrose Valley and Speeton Cliffs have never failed to attract the naturalist at Filey, and these localities had a prominent place in the arrangements for the recent excursion. In a short day visit it was not to be expected that much new information would be obtained, and the members, assembled mainly from Leeds, York, Scarborough and Hull, contented themselves with a re-examination of the cliffs between Filey and Speeton, a stretch of coast-line unique in its geological features, and rich in its forms of plant and animal life.

At the close of the day, tea, followed by a meeting, was held in the School Room, kindly placed at the disposal of the Union by the Vicar (Rev. Canon Cooper). Brief reports were rendered by Messrs. A. I. Burnley, F. A. Mason, Sydney H. Smith, A. Smith and J. W. Stather. A discussion was raised with regard to the collection of Fulmar Petrels' eggs by 'climbers,' and a resolution was adopted in which the attention of the Union's Wild Bird and Eggs Protection Acts Committee was requested. The Hon. Secretaries have since been in correspondence with officers of that Committee, and it is hoped, through their effort, that in the future the eggs of the Fulmar will receive the same measure of protection as that afforded to the eggs of other rare Yorkshire birds. The Executive of the Union has the satisfaction of learning on good authority that elsewhere in the county, the Fulmar has bred in full security. Further reference to this matter is made in the notes of Mr. S. H. Smith, included in this report.

Votes of thanks were accorded to the Vicar, who occupied the chair, and to Mr. J. W. Stather, who had so ably carried out the local arrangements. Eight new members were elected. The Union had the pleasure of welcoming, as a visitor from overseas, Mr. John Sheppard, a Past President of the Microscopical Society of Victoria.

GEOLGY (J. W. Stather).—Leaving the train at Speeton, a small but energetic party of geologists, including two ladies, made the best of their way down to the sea shore. Crossing the belt of hummocky drift, marking the terminal moraine of the great ice-field once filling the basin of the North Sea, and approaching the edge of the cliff, a charming and extensive view of Filey Bay and the adjacent coast-line was obtained. To the north across the broad sandy bay marking the outcrop of the Kimmeridge Clay, could be seen the stubborn reef of Filey Brig; the Middle Oolites adjacent being deeply covered with massive boulder clay, and beyond, the series of flat-topped nabs and hills, capped with the Lower Calcareous Grit, which characterises the Scarborough district; while turning to the south, the lofty and precipitous cliffs of Buckton, Bempton and the headland of Flamborough, were seen in fine perspective.

Making a leisurely descent by the grassy slopes of the Speeton undercliff, the shore was reached at a point where the Red Chalk (Hunstanton Limestone) occurs *in situ* at the base of the big chalk cliffs. Specimens of the characteristic fossil *Belemnitella minimus* were collected from this bed. After a short interval for lunch, the walk which had now become a scramble, was continued along the beach, covered with coarse shingle and big blocks of chalk from the cliffs which towered above. The next half hour was undoubtedly difficult going, but the party persevered until, a few hundred yards beyond 'Crow Shoot,' a patch of shore was reached entirely free from detritus, making it possible to examine the solid geology of the beach from the foot of the cliffs right down to the sea. Standing there and looking towards the cliff, a clean vertical, and unbroken section of Upper Cretaceous rock could be seen, at least 350 feet in height. As much time as possible was spent in this locality, collecting fossils, and noting the character and succession of the various beds, but much more could have been done had time permitted. On the return journey a brief visit was paid to the *jaculum* beds of the Speeton clay.

FLOWERING PLANTS (A. I. Burnley).—The flowering plants of the Filey Cliffs have already been described in *The Naturalist* by Dr. W. G. Smith, who gave fairly full descriptions of the arrangement of the plants in the ponds on the Flat Cliff, and by Mr. J. F. Robinson in connexion with the visit at Whitsuntide, 1914. Nearly all the plants mentioned by Mr. Robinson in the circular issued for this meeting were seen.

Geranium sanguineum is flourishing exceedingly well and seems more abundant than ever in 'Primrose Valley.' The same may be said of Saw-wort.

Genista tinctoria, a plant occurring very sparingly within a radius of twenty miles of Scarborough, was fairly common.

A special feature is the occurrence on the Boulder Clay of limestone-loving plants. The same feature has been noted immediately to the north and to the south of Scarborough. The beautiful *Spiraea filipendula* and Agrimony are examples. Since 1914, specimens of the Bee Orchis have been found in the valley, but it was too late to see any on this occasion.

Rosa omissa Déségl. was noted in the upper part of the valley, and *Rosa spinosissima* on the Flat Cliff.

In the 'Bog-bean Pond' were more specimens of *Ranunculus Lingua* than in 1914, but the plants looked unhealthy. East Riding botanists can see this plant in abundance in a pond near Cayton Station. Both bur-reeds were at their best in the pond farthest south and Scarborough

members were glad to meet with *Sparganium simplex* as it is scarce in their district.

Apium inundatum seems quite happy in the same pond (along the margin), although as far as the writer remembers, only one specimen was found at Whitsuntide, 1914. *Cakile maritima* occurred at the foot of the cliffs near the ponds, and this is unusual as the tide washes the foot of the cliff. At Cayton Bay the plant disappears and then again occurs after two or three years, and one would like to know if the seeds are carried by water.

MYCOLOGY (F. A. MASON).—Excellent lists of fungi are given in the two reports in *The Naturalist*, to which reference has been made.



The following species are additions to those lists; all were gathered either on the Boulder Clay, or were parasitic on plants growing thereon.

<i>Omphalia fibula</i> (Bull.) Fr.	<i>Coprinus radiatus</i> (Bolt.) Fr.
<i>Hygrophorus niveus</i> (Scop.) Fr.	<i>Dacryomyces deliquescens</i> Duby.
<i>H. psittacinus</i> (Schaeff.) Fr.	<i>Ustilago Hordei</i> Jensen
<i>Marasmius oreades</i> (Bolt.) Fr., in fine large fairy rings.	
<i>Galera hypnorum</i> (Schrank) Fr.	<i>Erysiphe cichoracearum</i> D.C.
<i>Psaliota campestris</i> (Linn.) Fr.	<i>Sphaerotheca pannosa</i> (Wallr.) Lév.
<i>P. arvensis</i> (Schaeff.) Fr.	<i>Phyllachora junci</i> Fr.
<i>Panaeolus campanulatus</i> (Linn.) Fr.	<i>Trichoderma lignorum</i> (Hay) Tode.

During the wait for the Filey train at Seamer, a cherry tree was found attacked by 'leaf scorch,' a disease produced by the fungus *Gnomonia erythrostoma* Awersw.

VERTEBRATE ZOOLOGY (S. H. Smith).—The party divided, some proceeding by train to Speeton and walking back to Filey along the cliff top; the writer and others taking the shore route on foot to Speeton and the cliff top route on return. There is nothing of outstanding note to report, except the fact of the Fulmar Petrel commencing nesting in the Speeton Cliffs. Unfortunately the climbers are taking the eggs and selling them to collectors, who await the egg gatherers' raids on the nesting ledges thronged with Guillemots and Razorbills. The Fulmar is protected by the Wild Birds Acts, but has been omitted from the Yorkshire

list so far as the protection of its eggs is concerned, and for this reason the Wild Birds and Eggs Protection Committee of the Yorkshire Naturalists' Union is prevented from taking action in the matter. The question was raised at the meeting which concluded this excursion, and the above explanation will no doubt be of interest to those who took part in the discussion.

A pair of Stonechats had a nest in the underbrush at Hunmanby Gap. The writer's attention was first attracted by the musical 'clink, clink,' from which the bird derives its name, a noise resembling the tapping together of small stones.

To list the species observed, the following were noted on the Cliffs :— Lesser Black-backed Gull, Herring Gull, Fulmar Petrel, Kittiwake, Guillemot, Razorbill, Jackdaw, Puffin, Rockdove, Rock Pipit, Swift and Sand Martin. By the shore and bottom of the cliffs :—Black Headed Gull, Shore Lark, Meadow Pipit ; and on the return along the cliff top and through the marshy hollows caused by land slips we saw Cuckoo, Tree Pipit, Stonechat, Linnet, Common Bunting, Reed Bunting, Yellow Bunting, Moorhen, Pied Wagtail, and Song Thrush.

Only the commonest species of mammals and batrachians were noted.

ENTOMOLOGY (A. Smith).—Lepidoptera were by no means plentiful owing to the rather cold north-easterly gale. Among the butterflies noted were, *Pieris napi* in numbers, *Caenonympha pamphilus* plentiful, as were also *Epinephele janira*, *Lycana icarus*, and *Chrysophanus phloea*s. One specimen, female, of *Argynnis aglaia* was noted. With regard to the moths, the narrow bordered five-spot Burnet was common on the cliffs between Filey and Speeton, in both pupa and imago stages, but only a single specimen of the six-spot Burnet was observed. The narrow bordered Five-spot Burnet, *Z. loniceyae*, from this locality appears to have a broader black margin to the hind wing than have our York specimens, and they more closely resemble *Z. trifolii*. *Z. filipendula* was also seen. *Odeyia atrata* was in plentiful numbers among grass. The larvae of *Hipocrita jacobaeae* and *Orgyia antiqua* were fairly common and *Petillampa arcuosa* occurred in marshy places near Hunmanby.

MOLLUSCA (A. Smith).—Freshwater species observed were *Limnea peregra*, *Sphaerium corneum* and specimens of a *Pisidia* still unidentified. The land species seen included *Helix aspersa*, *H. nemoralis* (and vars.), *H. arbustorum*, *H. cantiana*, *H. virgata* and vars., *H. caepitata*, *H. hispida*, *H. rotundata* ; *Pupa marginata*, *Clausilia rugosa* and *Succinea putris*.

The notes on Vertebrate Zoology embodied in the Circular for this Meeting (No. 201), should have been ascribed to Mr. Riley Fortune.

The writers have to thank Mr. Sheppard and Messrs. Brown, Ltd., Hull, for the loan of the blocks used in illustration of this report.

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A thigh-bone of a Crane, found on the site of the Roman station at Newstead, is the only record for that species in Scotland, and is referred to in *The Report of the Director of the Royal Scottish Museum* for 1921-2.

The Annual Report of the Yorkshire Philosophical Society for 1921 contains a useful list of additions, meteorological tables, and a valuable paper 'On the Pleistocene and Later Tertiary British Insects,' by Alfred Bell. The Society has also issued a valuable 'Catalogue of the Boynton Collection of Yorkshire Pottery,' by A. Hurst, with several useful illustrations.

The Carodoc and Severn Valley Field Club has issued its *Record of Bare Facts for the year 1921*, a list of the more noteworthy observations. (42 pp.). It is a very valuable compilation, and might well be copied by other of our Field Clubs. The referees are Rev. W. Fletcher, J. Cosmo Milvill, Rev. W. Ingrams, H. E. Forrest, E. S. Cobbold and Rev. W. La Touche.

BRITISH ASSOCIATION AT HULL.

THE Ninetieth Meeting of the British Association for the Advancement of Science was held at Hull on September 6th, and lasted a week. Favoured by excellent weather, the members were able to attend the meetings and excursions under the best of circumstances, and everyone seemed to have had a thoroughly successful week.

The number attending the meeting was over 1700, a figure much below that of Edinburgh the previous year, which was exceptionally high ; but practically the whole of the members attending the Hull meeting were serious students, and were not of the type sometimes present, who are merely out for a week's pleasant holiday. This was particularly noticeable in the case of a day excursion which had been arranged for Harrogate, which meant that those attending would miss their morning session, and only ten members visited that very charming town, where the Corporation had given a special invitation to entertain the party. This one unfortunate incident served as an indication of the type of member present at Hull.

The city was able to provide ample lecture-hall accommodation for the thirteen sections, for joint meetings, evening discourses, citizens' lectures, children's lectures, and other meetings, all within easy access of the Reception Room. The headquarters were in the Guildhall ; the large Reception Room having been specially decorated for the purpose, which, with its elaborate banners, floral decorations, etc., presented a most artistic appearance. The adjoining Banqueting Hall proved a suitable writing room and lounge, and, as the City Council was in vacation, the Council Chamber, various Committee Rooms, etc., were available for the use of members and officers, all these rooms being within a few yards of the Reception Room. Afternoon tea was supplied gratuitously to members throughout the meetings in the Lounge ; also at the Wilberforce House and the Ladies' Meeting Rooms.

In addition to the special postal arrangements, the Meteorological Department of the Air Ministry had charts, by means of which the weather conditions hour by hour were shown, the information being received by wireless telegraph. There was also a bookstall, and the usual arrangements made for the convenience of members. The large City Hall, and the Lecture Hall of the Royal Institution, were utilised for Citizens' Lectures and Evening Discourses as under :—

Tuesday, September 5th : a Citizens' Lecture, by E. H. Griffiths, M.A., D.Sc., F.R.S., on ' The Conservation and Dissipation of Energy.

Wednesday, September 6th : the Inaugural General Meeting. Presidential Address by Sir Charles Scott

Sherrington, G.B.E., Sc.D., D.Sc., LL.D., Pres. R.S.,
on 'Some Aspects of Animal Mechanism.'

Thursday, September 7th: a Citizens' Lecture, by Prof.
A. P. Coleman, M.A., Ph.D., F.R.S., on 'Labrador.'

Friday, September 8th: an Evening Discourse, by Prof.
W. Garstang, M.A., D.Sc., F.Z.S., on 'Fishing, Old
Ways and New.'

Saturday, September 9th: a Citizens' Lecture, by the
Rev. A. L. Cortie, S.J., F.R.A.S., on 'The Earth's
Magnetism.'

Monday, September 11th: a Citizens' Lecture, by Sir
Westcott Abell, K.B.E., on 'The Story of the Ship.'

Tuesday, September 12th: an Evening Discourse, by Dr.
F. W. Aston, F.R.S., on 'The Atoms of Matter.'

Tuesday, September 12th: a Citizens' Lecture, by Dr.
A. Smith Woodward, LL.D., F.R.S., F.Z.S., F.G.S.,
on 'The Ancestry of Man.'

The Queen's Hall, immediately opposite the Reception Room,
was the venue of a number of joint discussions; and the
City Hotel adjoining was the headquarters for luncheons,
and, with its ample room, proved admirable.

The question of accommodation for the visitors proved
much more serious than anyone had anticipated, and a large
staff was necessary in order to cope with the unusual situation
which obtained at Hull. The Hospitality and Lodgings
Committee was confronted with the extraordinary fact that
the whole of the hotels, lodging houses, boarding houses, etc.,
could only provide 125 beds, and this under very great pres-
sure. This resulted in all the accommodation available at
Hornsea, Withernsea, Beverley, Driffield and other places
having to be booked, in addition to which large numbers
were sent to Bridlington. Unfortunately, the absence of
ordinary late trains necessitated special trains being put on
for the week in order to cope with the matter, at a considerable
cost to the Local Committee; but with all this help it was
necessary for a house-to-house canvass to be arranged in order
to get the accommodation required.

However, by the time the meeting started, the situation
had been met, owing to the intervention of the Town Clerk;
a pleasing feature being the large numbers of ladies and
gentlemen who acted as hosts.

A large number of distinguished foreign scientists were
invited to Hull as guests of the Local Committee, in addition
to which the captains and staffs of the vessels used in con-
nection with Fisheries Investigation by various countries
abroad, added to the number of foreign scientists attending
the meeting.

The various Recorders and Secretaries of Sections, as well

as other Officers of the Association, and the guests of the Local Committee, were accommodated at the hostels at the Training College, Cottingham Road (the students being on vacation), and they were well looked after by the Principal, Miss C. T. Cumberbirch, B.A.

The various local arrangements were carried out by a number of committees, all the meetings of which were well and enthusiastically attended; in fact, the whole arrangements from beginning to end were carried out with a warmth which was refreshing. The Finance Committee, under the able chairmanship of the Rt. Hon. T. R. Ferens, P.C., J.P., was successful in obtaining a sum of £3000 (the amount necessary to carry out the meeting successfully), without municipal help, and without any public appeal being made. The Local Executive Committee was under the chairmanship of the Rt. Hon. The Lord Mayor of Hull (Councillor G. F. Wokes), and the other committees were as follows:—

Meeting Rooms Committee : Dr. J. T. Riley, Chairman.

Excursions Sub-Committee : Major W. H. Carver, J.P.,
Chairman.

Entertainments Sub-Committee : James Downs, Esq.,
O.B.E., J.P., Chairman.

Art Sub-Committee : Coun. H. Johnson, J.P., Chairman.

Handbooks Sub-Committee : Alderman J. Pybus, Chair-
man.

Hospitality and Lodgings Sub-Committee : Dr. E. Turton,
Chairman.

Each Section arranged its own afternoon excursions, and in these and other connections the Local Sectional Secretaries did admirable work, and considerably assisted in the various and numerous requirements of the sections being carried out without a hitch.

These local secretaries were:—

Section ' A ' (Mathematics and Physics) : H. G. Forder,
Esq.

Section ' B ' (Chemistry) : A. R. Tankard, F.I.C.

Section ' C ' (Geology) : A. Charlesworth, M.Sc.

Section ' D ' (Zoology) : C. F. Proctor.

Section ' E ' (Geography) : H. Vigrass.

Section ' F ' (Economics) : J. E. Forty, M.A.

Section ' G ' (Engineering) : Charles Downs.

Section ' H ' (Anthropology) : L. Jeffcoat, M.D.

Section ' L ' (Education) : J. T. Riley, D.Sc.

Section ' I ' (Physiology) : James Fraser, M.D.

Section ' J ' (Psychology) : Miss C. T. Cumberbirch, B.A.

Section ' K ' (Botany) : J. F. Robinson.

Section ' M ' (Agriculture) : J. Strachan, M.A., B.Sc.

Rooms Secretary : J. V. Saunders, M.A.

In addition, invitations to visit their works were given by : Messrs. Reckitt & Sons, Ltd., Starch, Blue, Metal Polish and Canister Works ; Messrs. Needlers, Ltd., Chocolate Works ; British Oil and Cake Mills, Ltd. ; Joseph Rank, Ltd., Flour Mills ; G. & T. Earle, Ltd., Cement Works ; National Radiator Works ; The North Eastern Railway Docks ; The Humber Portland Cement Works at North Ferriby ; and by the Hull Fishing Vessels Owners' Association to visit the Fish Dock. The Hull Trinity House, Cottingham Tuberculosis Hospital, and the Corporation Telephone Exchanges were also thrown open for inspection. These various firms, etc., made admirable arrangements for the members particularly interested, and in most cases provided refreshments. Messrs. Morton, Limited, gave a large number of free seats at the Grand Theatre to members of the British Association.

Excursions of a more general interest were made to Scarborough, Bridlington and Beverley, at the invitation of the respective Corporations, and to York at the invitation of the Yorkshire Philosophical Society, in each case the hosts providing refreshments. The party had an official welcome at York from the Lord Mayor. Special trains, reduced fares and other arrangements were admirably carried out by the staff of the North Eastern Railway, under the supervision of Mr. P. Carr.

As guests of the Local Committee, about 500 members were entertained on a River Trip to Spurn Point : the P.S. ' Brocklesby ' having been kindly placed at the Committee's disposal by the Great Central Railway Company. Refreshments and an orchestra were provided by the Local Committee, while chocolates and liquid refreshments were handed round, largely owing to the generosity of local firms.

At the request of many members, the Sites of the Lost Towns of the Humber, and other features were pointed out by the present writer.

A pleasant Garden Party was arranged jointly by the Governors of Hymers College and the Hull Literary and Philosophical Society, when various entertainments were provided.

There were one or two new features at Hull which seem to have been appreciated, judging from the members' remarks and press reports. Each member was provided with an artistic badge in enamel and gold, each of which bore the number of the member's ticket, and, by the aid of the numbered index to the List of Members, the identification of any particular person could at once be established. These badges were worn throughout the meeting by everyone, from the President downwards, and practically gave free admission to various meetings and social functions.

Also, through the courtesy of Councillor A. Digby Willoughby, the Chairman of the Hull Tramway Committee, and the members of the committee, free travelling was obtained by all those wearing badges. This courtesy was much appreciated.

The public lectures were given on a scale which hitherto, perhaps, had not been attempted; an innovation of much value. It was a pleasant surprise to the Local Committee to find how heartily these were supported—in some cases hundreds of people having to be turned away. The Children's Lectures—another innovation—were given as follows:—

Thursday, September 7th : Professor J. Arthur Thomson, on 'Creatures of the Sea.'

Friday, September 8th : Mr. F. Debenham on 'The Antarctic.'

Tuesday, September 12th : Professor H. H. Turner, F.R.S., on 'The Telescope and what it tells us.'

For this purpose, Hull's largest Picture House (the Majestic) was placed at the disposal of the Local Committee, free of charge, by Messrs. Morton, Limited; and, by arrangement with the Local Education Authority, every seat was occupied by the more advanced boys and girls from the various Hull schools.

A pleasant feature was the ready way in which the Hull Corporation, the Literary and Philosophical Society, the Church Institute and other bodies placed their rooms at the disposal of the Local Committee without cost.

The Lord Mayor's Reception, held early on in the meeting, was specially arranged in order that a *Conversazione* might be 'a conversazione indeed,' and an excellent opportunity was afforded for the members to meet each other and renew acquaintances.

With regard to the publications, the printers' strike, unfortunately, seriously interfered with these, but by working day and night, it was possible to prepare a 'Handbook to Hull and the East Riding' (540 pp.), and also a Local Programme to the meeting. The latter contained details of the meetings day by day, in addition to which were notes on the chief places of interest in the district, and a description of the Exhibition in the Board Room of the Education Offices, which had been arranged by the Committee of the Yorkshire Naturalists' Union, with Professor J. H. Priestley, F.L.S., as Chairman, and Mr. W. R. Grist as Secretary. This exhibition was much appreciated; so much so that the Council of the Association passed a resolution suggesting that similar exhibitions should be held in connection with future meetings. Reprints of this section of the Local Programme were distributed to visitors to the exhibition.

The Local Committee likewise provided a description of the Corporation Plate and Regalia which was exhibited in the Reception Room during the meeting. Each member received the *Journal*, issued by the Association, and also a List of Members.

In preparing the Handbook an attempt was made to secure the work of the best authorities available, and the general result seems to have been satisfactory.

In addition to the literature mentioned, arrangements were made for a daily programme to be issued free to members, in which the various meetings throughout the day were set forth, hour by hour, this proving to be a great convenience, and was greatly appreciated, as it simplified the task of searching through the Local Programme and Journal.

A feature of the Local Programme was the insertion of portraits of the various officers of the Association, the chairmen of local sub committees, the local secretaries of sections, and others, for whom the members might be in search.

As the present writer happened to be one of the local secretaries, he cannot say much in reference to the success of the meeting: he is satisfied, however, that the hard work for several months past has not been in vain.—T.S.

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Part 1 of Vol. XV. of *The Lancashire and Cheshire Naturalist* reverts to its original editor, Mr. W. H. Western.

The Geological Society of London has issued the 'Abstracts of the Proceedings,' Nos. 1075-1090 (98 pp., 6s.).

A third edition of 'A Short Guide to the Museum of Practical Geology, Jermyn Street, London,' (44 pp., 2d.), has recently been published.

E. O. Ulrich, in a paper on Major Causes of Land and Sea Oscillations (*Smithsonian Report*, published 1922), describes a palæontologist as 'a kind of geologist who should be seen but not heard on physiographic and diastrophic questions.'

There are three Yorkshire species figuring in Part 35 of Buckman's 'Type Ammonites':—(a) *Perisphinctes subbakeriae*, South Cave = *Anaplanulites difficilis*, var. *Macrocephalitan*, *Catacephalites*. (b) '*Ammonites koenigi*' Gristhorpe; *Proplanulites arciraga* Teisseyre, *Proplanulitan*, *fracidus*. (c) *Ammonites vernoni*, Scarborough; *Klematrosphinctes vernoni* Bean-Young, sp. *Cardioceratan*, *vernoni*.

Among the contents of *The Annual Report, etc., of the Bristol Naturalists' Society*, we notice 'Natural Sources of Energy,' by Dr. E. H. Cook; 'The Influence of Environment on the Development of Prehistoric Man,' by Dr. L. S. Palmer; 'Bristol Botany,' by J. W. White; 'Lightning Discharge at Bridlington Church,' by E. H. Cook; and 'Carboniferous Limestone of Broadfield Down,' by F. S. Wallis.

The Transactions of the British Mycological Society (Vol. VII., pt. 6) contain 'Lichens of Haslemere District,' by H. Knight; 'Fruit Bodies of *Dacryomyces Deliquescens*,' by Prof. A. Buller; 'Wood Staining Fungi,' by B. D. MacCallum; 'Slugs on Mycophagists,' by Prof. Buller; 'Wilting of Michaelmas Daisies,' by W. J. Dowson; 'A Discomycete found on Medlar Fruits,' by H. Wormald; 'Studies in Discomycete,' by Jessie Elliott; and other items.

NATURALISTS' FIELD DAY AT ASKHAM BOG.

W. FALCONER, F.E.S.

By the courteous permission of Colonel J. Eason Wilkinson and H. Lycett Green, Esq., the Entomological Section and the Plant Gall Committee of the Y. N. Union visited Askham Bog on June 24th last. The party was met at York station by Mr. Sidney H. Smith, who very kindly conveyed the members in detachments in his motor car to the starting point at Chandler's Whin. Despite the heavy showers, and the unpleasantly moist condition of the vegetation, and the painful bites of multitudes of 'gimlet-nosed' flies, the work of investigation was carried out with unabating vigour to a successful conclusion. Lepidopterists were the most numerous, and in addition, the Rev. C. D. Ash and Mr. S. Walker had spent the evening before, from 9 p.m. to 1 a.m., in the bog, mostly, but not profitably, 'sugaring,' so that both the diurnal and nocturnal species received attention. (Incidentally, it is worthy of record that the latter recently took a *Colias edusa* at Strensall.) The outstanding captures of the day were *Bactra furfurana* Haw. and *Plusia festucae* Linn. (B. Morley), and *Laverna phragmitella* Stt. (G. T. Porritt). Mr. M. L. Thompson, the one coleopterist present, met with an unusual proportion of critical species, which included *Myllaena dubia* Grav., new to Yorkshire, and *Bembidium doris* Panz., second occurrence in the same area. Examples of *Saperda populnea* Linn. were taken, and both Mr. W. P. Winter and the writer found its gall. The latter also secured the gall of *Mecinus pyraeaster* Herbst., although the beetle itself was not captured by anyone who attended the meeting. Mr. J. M. Brown, working at the Hemiptera, obtained four species of Homoptera new to Yorkshire, viz., *Deltocephalus striatus* Linn., *Cicadula warioni* Leth., *Dikraneura similis* Edw., and *Typhlocyba rosae* Linn.

In one part of the bog several willows were bespattered from top to bottom in most prodigal profusion with huge agglomerations of 'cuckoo spit.' Such remarkable displays of it can only, one would imagine, be very rarely seen.

So far, mainly with respect to the more prominent winged inhabitants of the bog; but the presence of the lesser known and studied forms of life was made known to the gall student by the abnormal growths and plant deformations, which they produce in their larval or other stages.

In the reports which follow, the species new to the county are marked with an asterisk.

LEPIDOPTERA (B. Morley).—The intermittent showers made systematic work with the lepidoptera impossible. From the first the herbage was drenched, consequently the insects were sluggish. The butterflies seen were *Pieris napi*, *Epinephele ianira*, *Coenonympha pamphilus*, *Lycaena icarus* and *Hesperia sylvanus*. The moths noted were as follows: *Cataclysta lemnata* and *Hydrocampa nymphaeata*, both common around the ponds in Chandler's Whin, where also the larvæ of *Nonagria arundinis* were very plentiful in the bulrush stems. During a period of comparative brightness *Glyphipteryx thrasonella* and *Coleophora caespititiella* flew commonly with a few each of *Tortrix viburniana*, *T. costana* and *Bactra furfurana* among the sedge. *Poedisca bilunana* abounded on birch trunks, and a few *Collix sparsata* were disturbed from alder. A specimen of *Plusia festucae* (one of the bog specialities), was found. *Argyresthia pygmaeella* was beaten from sallow and *Penthina salicella* from willow. Many other commoner species were noted, and of these the great abundance of *Melanippe sociata* is worthy of note.

(G. T. Porritt).—An interesting lepidopteron turned up in *Laverna phragmitella*, the larvæ of which were evidently feeding in great abund-

ance in the old heads of the *Typha* (bulrush). The species has not been recorded for Yorkshire since the late Lord Walsingham found it in abundance at Sherburn on the occasion of the Yorkshire Naturalists' Union's excursion there on June 2nd, 1884.

To the above records, the Rev. C. Ash adds *Leucania comma* L., *D. cucubali* Fues., and the more local *L. impudens* Hb. and *P. lignata* Hb.

COLEOPTERA.—M. L. Thompson reports that he met with the following species in moss at the edges of ponds in Chandler's Whin: *Bembidium doris* Panz., *Pterostichus minor* Gyll., *Agonum piceum* L., *Anacaena limbata* F., **Myllaena dubia* Grav., *Philanthus fumarius* Grav., *Lathrobium geminum* Kr., *L. quadratum* Pk., *L. terminatum* Gr. var. *immaculatum* Fowl., *Stenus latifrons* Er. Of these insects two deserve special mention; *B. doris* Panz. has only once been recorded for Yorkshire, whilst *Myllaena dubia* Grav. does not appear to have been previously taken in the county. Later in the day in the bog itself, *Donacia marginata* Hoppe (*limbata*, Panz.), *Saperda populnea* L., *Rhagonycha testacea* L., *Galerucella nymphaeae* L., *Aphthona coerulea* Geoff. (*non-striata*), and *Limnobaris T-album* L. were taken.

DIPTERA (J. H. Ashworth).—The date was an in-between one for Diptera, and under the circumstances I was well satisfied to meet with about 30 to 35 species, amongst which I have not noticed anything that demands record, and to enumerate common species which can in their season be found in most places, would give a wrong impression of this interesting locality. The best capture was the brilliant *Pachyrrhina crocata* by Mr. Winter. (For an addition to the county list see the Plant Galls report).

HEMIPTERA (J. M. Brown).—Owing to the wet state of the vegetation collecting for the Hemiptera was carried out under unfavourable conditions. Neither 'beating' nor 'sweeping' was very successful. The following 31 species were obtained, of which four have not been listed previously for the county.

I.—HETEROPTERA.

<i>Scolopostethus affinis</i> Schill.	<i>Orithotylus marginalis</i> Reut.
<i>Salda littoralis</i> L.	<i>Phylus palliceps</i> Fieb.
<i>Anthocoris confusus</i> Reut.	<i>Psallus ambiguus</i> Fall.
<i>A. nemorum</i> L.	<i>P. betuleti</i> Fall.
<i>Calocoris striatus</i> L.	<i>P. variabilis</i> Fall.
<i>Plesiocoris rugicollis</i> Fall.	<i>P. varians</i> H.-S.
<i>Dicyphus stachydis</i> Reut.	

II.—HOMOPTERA.

<i>Oncopsis alni</i> Schr.	* <i>D. similis</i> Edw.
<i>O. flavicollis</i> L.	<i>Eupteryx urticae</i> Fabr.
* <i>Deltocephalus striatus</i> L.	<i>E. atropunctatus</i> Goeze.
<i>D. pulicaris</i> Fall.	<i>Typhlocyba ulmi</i> L.
<i>Limotettix 4-notata</i> Fab.	<i>T. tenerrima</i> H.S.
* <i>Cicadula warioni</i> Leth. (<i>fasciifrons</i>)	* <i>T. rosae</i> L.
<i>C. 6-notata</i> Fall.	<i>Cixius nervosus</i> L.
<i>C. feberi</i> Edw.	<i>Psylla peregrina</i> Först.
<i>Dikraneura flavipennis</i> Zett.	<i>P. alni</i> L.

TRICHOPTERA (G. T. Porritt).—I have very little to report as practically all my time was spent in a fruitless search for the rare *Phacopteryx brevipennis*, of which, out of the some half dozen specimens known to be British, three are from Askham Bog, or, as I suspect, Chandler's Whin, the ground there being so much more suitable for it. For such a locality Trichoptera were remarkably scarce, and I saw only very common species.

NEUROPTERA (G. T. Porritt).—There was not sufficient sun to tempt

the larger dragonflies on the wing, but of the smaller species the somewhat local *Agrion pulchellum* was apparently fairly common amongst the universally abundant *A. puella*, *A. cyathigerum* and *Ischnura elegans*. The only Chrysopa noticed was *C. tenella*.

ARACHNIDA.—Circumstances were not favourable to spider collecting, and only incidental specimens came to hand, but, although common species, the following have not before been definitely recorded from the bog: *Clubiona reclusa* Cb., *Linyphia clathrata* Sund., *Pirata piraticus* Clerck., *Dictyna arundinacea* Linn., both sexes spun up together in heads of grass, the classic example of conjugal felicity amongst spiders. An Erigoniid spider, apparently not long deceased from the freshness of its tissues, had been the victim of some parasitic fungus, whose mycelium and conical outgrowths were conspicuous.

PLANT GALLS.—W. P. Winter and the writer were responsible for the work done in this branch. Several of the forms previously recorded for the locality† were again met with, some of them more plentifully and extensively, but they are not now enumerated. The galls of *Lipara lucens* Mgn., found in quantity in the same part of the bog where they were originally discovered, proved on investigation to be empty except for the pupa case, so that the fly itself is still a desideratum. It does not, as many agents do, perforate the lignified sides of the growth, leaving behind it visible evidence of its exit, but makes its way upwards between the loose withered enveloping leaves, the larva just before entering the pupa state cutting through the hard apex of its cell (which the fly itself is incapable of doing), and affixing itself there, so that the imago on emerging finds an unimpeded course to freedom. Although the insect itself did not materialise, the writer bred out from the galls he gathered thirteen examples (both sexes) of an inquiline, *Anthomyza gracilis* Fln. (named by C. A. Cheetham), an addition to the county list. The above two flies are in themselves a striking testimony to the value of plant galls as a scientific field study. F. A. Mason has since come across *Lipara lucens* galls in plenty on Strensall Common.

Including all agents, recognised or otherwise, 35 different kinds not before recorded for the bog were noted, amongst them being: 1, *Iteomyia major* Kieff. on *Salix pentandra* and *Saperda populnea* Linn. on *S. cinerea*, both new hosts; 2, *Perrisia inclusa* Frn., *P. praticola* Kieff., *Eriophyes atrichus* Nal. on *Stellaria glauca*; *Eriophyes?* spec., an erineum on hawthorn leaf, and a *Psyllid?* spec. on a birch leaf, new to Yorkshire.

Several well marked cases of deformation—the shortening and thickening of stems or floral axes with the consequent close grouping of leaves or inflorescence were noticed as being due to *Aphrophora spumaria*, an acknowledged agent abroad, but not yet in this country. The fungus *Triphragmium ulmariae* Wint., which contorts and swells some parts of the leaf of its host has also not yet been admitted to the British Gall list.

Unless otherwise stated the locality is Askham Bog, and species new to the county are asterisked.

COLEOPTERA.

Saperda populnea Linn. on *Salix caprea* and **cinerea*.

Mecinus pyraister Herbst. on ribwort plantain, one example.

HYMENOPTERA.

Pontania pedunculi Htg. on *Salix cinerea*, Askham Bog and Chandler's Whin.

Cryptocampus medullarius Htg. on *S. pentandra*, Miss Grainger.

The next four on oak.

Andricus trilineatus Htg., Chandler's Whin.

† Vide *The Naturalist*, April, 1922.

Biorrhiza pallida Oliv., common in both localities. Some 'oak apples' produce both sexes, others males only or females only. The two examples taken produced males only, together with some parasites. The males are winged; the females not. The reason is obvious. The males have nothing to do beyond their natural function. The females must creep down deep into the ground to oviposit in a root; wings would be an encumbrance.

Neuroterus baccarum Linn., both localities, on leaves.

Cynips kollari Htg., M. L. Thompson.

DIPTERA.

**Perrisia inclusa* Frauen., old and new galls on *Phragmites communis*.
No external indication beyond the perforation.

Iteomyia capreae var. *major* Kieff, on **Salix pentandra*.

Rhabdophaga salicis Schrnk, on *Salix caprea* and *cinerea*.

Macrodiplosis dryobia F. Löw, on oak, Chandler's Whin.

Perrisia urticae Perr., on nettle.

P. persicariae Linn., on *Polygonum amphibium*.

**P. praticola* Kieff on ragged robin.

Oligotrophus bursarius Brmi. on ground ivy.

Urophora solstitialis Linn. on black knapweed. No outward indication.

Flies bred out 7th August.

Rhopalomyia ptarmicae Vall. on sneezewort.

HOMOPTERA.

**Psyllid?* spec., leaf of birch blistered as in *Rhopalomyia ribis*; insects plentiful on the under surface.

Callipterus quercus Kalt., on oak, Chandler's Whin.

Aphis atriplicis Linn., on *Atriplex patula*, in a tilled field bordering on the bog.

A. viburni Scop., on guelder rose, both localities.

HEMIPTERA.

Aphrophora spumaria Linn., on *Ranunculus acris*, *Potentilla comarum*, *Rumex hydrolapathum*, *R. conglomeratus* and *Polygonum amphibium*.

ACARI.

Eriophyes rudis Can., 'big bud,' and *E. lionotus* Nal., on birch, the latter in Chandler's Whin.

E. atrichus Nal., on **Stellaria glauca* With.

**Eriophyes?* spec., on hawthorn leaf, Chandler's Whin. On upper surface an unevenly rounded elevation tinted reddish brown; a corresponding cavity below, 4 mm. in diameter, filled with an erineum of short, stout, irregularly bloated hairs, first pale, passing through yellow brown to red. First noticed two years ago near Llangollen, N. Wales, and can find no reference to it in any gall book.

EELWORM

Tylenchus? spec., on long rooted cat-sear, scape just below the capitulum swollen and distorted; eelworms noted within the swelling.

FUNGUS

Triphragmium ulmariae Wint., parts of the leaf of meadow sweet swollen and distorted.

—:O:—

The Annual Report of the Board of Regents of *The Smithsonian Institute* for 1920 is to hand, and is quite equal to its pre-war standard of excellence. It contains over 700 pages of valuable memoirs.

The Proceedings of the Cambridge Antiquarian Society, No. 71, contains among much interesting matter, 'Killicks: a Study in the Evolution of Anchors,' by R. Morton Nance; 'Cambridgeshire "Forests"' by Rev. H. P. Stokes.

SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.

SUPPLEMENT.

THE preceding list having been in course of publication since June, 1918, further material in the way of papers and specimens has naturally accumulated, rendering a supplement necessary to bring the subject matter up to date (the end of 1921).

BIBLIOGRAPHY.

This includes some earlier papers and notes from publications to which I had had no access, but which had been listed by the late Mr. W. Denison Roebuck.

R. H. MEADE.

1852.—On the Method of Preserving Spiders, etc.—*Zoologist*, Vol. X., pp. 3676-8. Page 3678, notes on various species of Linyphia found in Yorkshire.

1855.—Notice of his capture of *Neriene affinis*.—*Zoologist*, Vol. XIII., p. 4828, copied from J. Blackwall, Ann. and Mag. of Nat. History, 1855.

1860.—Gossip on Spiders.—*Zoologist*, 1860, pp. 7146-7151. No positive Yorkshire records, but mention of *Tegenaria derhamii*, *Amaurobius similis* and *Zilla x-notata* (present nomenclature) as if found at Bradford.

REV. O. P. CAMBRIDGE.

1859.—Remarks on Arachnida.—*Zoologist*, Vol. XVII., pp. 6493-6502. Yorkshire Notes, pp. 6497, 6499, 6500-1.

1860.—Supplement to a Note on Arachnida of Dorset and Hants.—*Zoologist*, Vol. XVIII., pp. 6862-6. Yorkshire notes on pp. 6862, 6864-5.

1861.—Notes on Spiders captured in 1860.—*Zoologist*, Vol. XIX., pp. 7553-7563. Yorkshire notes on p. 7559.

J. BLACKBURN.

1864.—Diving Water Spiders (*Argyroneta aquatica* Walck.).—*Huddersfield Naturalist*, August 1st, Vol. I., pp. 109-110. Habits of Yorkshire specimens.

"Scientific Opinion."—*Epeira scalaris* at Bishop Wood, October 13th, 1869, Vol. II., p. 421.

JAMES CARTER.

1874.—Egg cocoons found on 10th July in a cave called 'Cat's Hole,' in Nidderdale, near Lofthouse, and sent, along with specimens of the spider, to the Editor of *The Field*, and named by the latter *Epeira fusca*=*Meta menardi* (page 80).

S. L. MOSLEY.

1877.—*Epeira scalaris* Walck. at Wharnccliffe.—*The Naturalist*, November, Vol. III., p. 59 and p. 61.

CHARLES SMETHURST.

1877.—Exhibition of *Dolomedes mirabilis* from Bishop Wood.—*The Naturalist*, August, p. 12.

1880.—Arachnidæ (*sic*) near Selby.—*The Naturalist*, January, Vol. p. 93, four species.

JOHN GRASSHAM.

1881.—The Water Spider (*Argyroneta aquatica*).—*The Naturalist*, December, Vol. VII., p. 84.

W. D. ROEBUCK.

1881.—Notes on a few common Yorkshire Spiders.—*The Naturalist*, December, Vol. XII., pp. 83-4.

CHARLES MOSLEY.

1916.—Foreign Spider at Huddersfield (*Zoropsis rufipes* Luc.).—October, p. 330.

W. FALCONER.

1917.—Abnormal Spiders.—*The Naturalist*, July, pp. 232-3.

1919-22.—Annual Reports of Arachnida Committee, Yorkshire Naturalists' Union for 1918, 1919, 1920, 1921 in the January issue of *The Naturalist*.

In the accounts of the Union Meetings at the following places—*The Naturalist* :—

1919.—Ryhill, August, p. 273 ; Hawes, September, pp. 305-6.

1920.—Reeth, August, pp. 254-5.

1919.—New and Rare British Spiders.—*The Naturalist*, September, pp. 296-302. Eight figures.

J. W. H. HARRISON.

1918.—Notes on the Spiders of North Yorkshire.—*The Naturalist*, October, pp. 316-7.

C. A. CHEETHAM.

1921.—In 'Why is *Boreus* a Winter Species ?'—*The Naturalist*, May, p. 167. Seven species.

NOTES ON DISTRIBUTION.

Steatoda bipunctata Linn., *Metopobactrus prominulus* Cb., *Styloctetor penicillatus* Westr., *Leptyphantis nebulosus* Sind., *Ero cambridgii* Kulcz., and *Hahnna helveola* Sim. have now been found in Ireland.

Neither *Porrhomma microphthalmum* Cb., nor *P. errans* Cb. is Irish, the examples taken being referable to *P. thorellii* Herm., and the former in one instance to *P. campbellii* F.O.P. Cb.*

(To be continued).

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CORRESPONDENCE.

CUCKOO DOINGS.

On p. 237 of *The Naturalist*, Mr. E. P. Butterfield raises the question 'whether the cry "cuckoo" is common to both sexes.' On May 24th last were frequent loud cries of 'cuckoo' about 7 a.m. in the garden close to my bedroom; and I saw two adult birds sitting on a thorn hedge about twenty yards away, both 'cuckooing' loudly. They behaved towards each other for about a minute much like two doves in courting, and also flew away together both calling 'cuckoo,' leaving no doubt in my mind that, as Mr. Whitaker states, 'both sexes call "cuckoo."' I have frequently seen one Cuckoo calling from among trees alongside a large field south of the house; and another Cuckoo reply and fly to the

* Some New Irish Spiders, D. R. Pack-Beresford. *Irish Naturalist*, October, 1911.

first caller, crying 'cuckoo' on the way; sometimes also the bubbling notes intermixed with the 'cuckoo'—evidently male calling female. As to behavior of other birds in presence of a Cuckoo, about the middle of June, 1922, two Starlings gave a long-distance chase after a single Cuckoo, pecking and chivvying it as it flew over the above-mentioned field, the pursuit being over about two hundred yards. They were already in pursuit when seen by me, and therefore I am unable to say the cause of the disagreement.—FREDERICK D. WELCH, M.R.C.S.

SEPARATION OF THE SEXES OF THE CHAFFINCH IN WINTER.

IN *The Naturalist* for 1918, page 75, I had a note on the above subject, to which is added a note by Mr. R. Fortune, in which he states, 'The separation of sexes is very marked in this (Harrogate) district, where we see flocks both of male and female. Numbers of males have frequented the vicinity of my house this winter,' and referring to these notes Mr. Porritt states in *The Naturalist* for March, 1918, page 110, 'It must be over forty-five years since I controverted (in one of the then natural history journals, *Young England* I think it was) so far as this district is concerned (Huddersfield) the statement in ornithological works that the sexes of the Chaffinch separate in winter.' Mr. Porritt will probably not deny that this separation of the sexes in winter occurs, and even over a wide area, in Britain and on the continent of Europe. I should like to know whether any observer can definitely say that no separation of sexes ever takes place—even within a limited area such as includes Harrogate, Huddersfield and Wilsden districts, are three observers of bird-life, each of which gives a different version. Mr. Fortune states that in the Harrogate district he sees both male and female flocks of Chaffinches in winter, whereas Mr. Porritt states that for forty-five years he had never once noticed the separation of the sexes in his district. I have been an observer of bird life for over forty-five years in this district (Wilsden), and have never once seen a flock of Chaffinches composed exclusively of females, or even largely of females. All the flocks in winter I have seen have been almost all males, usually only a few females. Seeborn says, 'It is probable that this peculiar habit is confined to the birds that come to our shores in autumn,' and another naturalist makes the statement that it is stated 'on good authority that no separation of males and females takes place in the south and west of England,'—both of which statements, the latter especially, are open to doubt.—E. P. BUTTERFIELD.

Members of the Yorkshire Naturalists' Union might, during the coming autumn and winter, make special observations upon the points raised by Mr. Butterfield.—R. F.

CLOUDED YELLOW BUTTERFLY AND HIBERNATION.

This migrating species has occurred the present year in various parts from south coast as far north as Lancashire (in my neighbourhood both in May and June, and offspring of above in Aug. and Sept.). As a west-country writer (Mr. Harcourt Bath), raised the question of hibernation in one of the August numbers of *The Field*, it may be worth adding that in 1893-4 I lived near Devonport, and although *Colias edusa* was common round there in August and September, 1893, there was no evidence of hibernation, even though the winter following was mild. As it did not hibernate there in that south-west county, there seems to be no reason to think the species ever hibernates in England.—FREDERICK D. WELCH, Sept. 21st, 1922.

Very many years ago, the late J. W. Tutt satisfactorily established the fact that *Colias edusa (croceus)* cannot in any stage survive the severity of our British winters. The early summer specimens which

occur here are immigrants from the continent, and from them the late summer or autumn emergence is produced. There was one of the periodical immigrations this year, and every lepidopterist of experience anticipated its occurrence in large numbers this autumn. That has been so in the south of England, although it is probable that the unusually cold summer we have had killed off many of the feeding larvæ, and so prevented a still greater abundance. The progeny of the autumn brood in Britain die off as larvæ, or as pupæ if the weather is mild enough to allow them to reach that stage. A specimen was taken here (Huddersfield) recently a short distance from my house, and another one reported as seen; and Mr. Samuel Walker took one of the immigrant specimens at York in June.—G.T.P.

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BRITISH MYCOLOGICAL SOCIETY.

A. E. PECK.

THE Annual Fungus Foray of this Society was held at Keswick, Sept. 15th to 21st. Of the 50 or 60 members assembled, the following were more particularly associated with the Mycology of Yorkshire:—W. N. Cheesman, J.P., Sir Henry C. Hawley, Bart., Professor Priestley, A. E. Peck and Miss C. A. Cooper. At the Annual Meeting, Mr. Cheesman was elected Vice-President. In accepting the honour, Mr. Cheesman playfully recalled that he was one of the founders of the Society, if not the actual 'father of the child,' which had its inception at an hour subsequent to midnight, while members lingered over the 'cups and saucers' at a meeting held at Selby 26 years ago. Headquarters were at the Royal Oak Hotel, but for examination and display of specimens, as well as for meetings and lectures, the hall over the Public Library was used. The woods bordering Thirlmere, Derwentwater and Bassenthwaite Lake were the chief gathering grounds. The Presidential Address by Mr. F. T. Brooks was on 'Some Present Day Aspects of Mycology.' Other addresses were 'Luminosity in *Panus*,' by Professor A. H. R. Buller (of Manitoba University); 'Notes on Fungi in the Alps,' by Mr. Somerville Hastings; 'Fungus Hunting in the West Indies,' by Miss E. M. Wakefield; and 'Edible Fungi,' by Mr. Carleton Rea.

The meeting was not without its humours. On the day of assembly, the hotel-porter communicated to a late arrival the circumstance that he was more than usually fatigued, a large party of *Herb specialists* having come into the hotel during the day.

Following Professor Buller's lecture on 'Luminosity in *Panus*,' it was decided that the company should sit in darkness for a few minutes in order to observe any indications of luminosity in the many specimens of fungi which were spread out upon the tables. None was detected, not even in *Panus stypticus*, American examples of which species had been the chief subject of the lecturer's remarks. The unusual proceedings, however, caused not a little mirth, which was increased when the caretaker came anxiously upon the scene to enquire what had gone wrong. His fears were soon calmed and he promptly retired, but the company could not help feeling that they had given the man opportunity for confirming any impression which he may have held, in common with so many other persons, that the ways of naturalists in general, and 'Herb specialists' in particular, are rather more than passing strange.

Mr. Rea was in capital form. People asked, he remarked, why he could not use English names for his favourites instead of such 'jaw-breakers.' He reminded his audience of the difficulties of such a departure. For instance, take *Psalliota haemorrhoidarius*—was he to emulate Bernard Shaw in 'Pygmalion'?

REVIEWS AND BOOK NOTICES.

Our Homeland Prehistoric Antiquities, and how to study them, by **W. G. Clarke.** Homeland Association, 139 pp., 4s. 6d. net. The author is a prominent East Anglian 'Prehistorian,' though his views are not extravagant. In fourteen chapters he deals with Man before History, How to Distinguish Flint Implements, Where to find Flint Implements, Flint and its Changes, Eoliths, Drift Palæoliths, Cave Palæoliths, Neoliths, Bronze and Early Iron Implements, Prehistoric Trackways, Dwellings, Burial Places and Forts, Flint Mining, Pottery, The Pleasures of Field Work. In this last he tells us 'I know of one man who found a hoard of bronze implements as the result of a dream, *but this method cannot be universally recommended.*' There is a short glossary and what is described as a 'Bibliography.' In this last we fail to see any reference to Pitt Rivers' well-known volumes, to Bateman's two books, to Stevens' 'Flint Chips,' etc.; and if the now 'Lord Avebury' is given as the author of 'Prehistoric Times,' should not the last edition (1913) be given and not 1865? Mr. Clarke is to be congratulated on producing a useful handbook, which should still further increase the number of students of prehistoric remains. There are, of course, points upon which all will not agree, and we feel sure that if the author carefully peruses Prof. Macalister's volume, recently reviewed in these pages, he will modify many of his views, and we therefore look forward to the second edition.

Les Coléoptères d' Europe : France et Régions Voisines. Par le **Professeur C. Houlbert.** Paris : Libraire Octave Doin, 1922. Tome II., 340 × xii. pages, avec 99 figures dans le texte et 30 planches. Tome III., 298 × xii. pages, avec 30 figures dans le texte et 30 planches. Prix 12 fr. net. These two volumes complete an introduction to the genera of Coleoptera inhabiting France and neighbouring countries, of which the first volume was noted in *The Naturalist*, June, 1921, p. 222. The author has compressed a large amount of interesting detail concerning the life history and habits of the families dealt with, including remarks on the structure of the larva (with figures of this stage in many instances), together with systematic tables for the determination of the genera, which, as far as the writer has tested them, should prove extremely useful to students of the order. Most of the genera are illustrated by figures which usually have caught the characteristic facies of the insect delineated, and should, when taken in conjunction with the tables, be very helpful. The arrangement of the families is, for the greater part, in accord with continental usage, and at first may seem strange to the amateur who is merely familiar with the method of classification in use up to the present in this country. A comprehensive alphabetical index, however, will enable him to find with ease any genus on which he desires information. It goes without saying that many of the insects treated of in the work do not occur in Great Britain, but this gives a broader view to one's visualization of the various families, and it will be found that very few genera which occur in this country are unrepresented. A Bibliographical Index of over a dozen pages in each volume, divided into two sections, 1 Anatomy and General Biology, and 2, General and Local Faunas, will be welcomed by the more advanced student, and is a feature which, with advantage, might be more generally adopted in introductory treatises on Entomology in this country. The volumes are of handy size for the pocket, and the interesting presentation of their subject matter makes them such that they can be perused on any occasion with pleasure and profit, and not merely when one is attempting to ascertain the genus to which an individual beetle belongs. The work can be thoroughly recommended as an introduction to the study of Coleoptera, though as genera only are differentiated, it will be necessary for the student to consult more exhaustive works for specific characters.—
W.J.F.

NEWS FROM THE MAGAZINES.

Mr. R. J. Welsh, M.R.I.A., has joined the editorial board of *The Irish Naturalist*.

The Lancashire and Cheshire Naturalist has reverted to Mr. W. H. Western, of Darwen.

We see *Science Progress* refers, more or less appropriately, to the *Quart. Journ. Geol. Soc.*

W. J. Lucas's 'Notes on British Orthoptera in 1921,' appears in *The Entomologist* for September.

J. Waterston writes 'On the Bird Lice Parasitic upon British Grouse,' in *The Scottish Naturalist*, No. 127.

The Essex Naturalist, issued in September, records the death of William Cole, founder of the Essex Field Club.

Nature for July 22nd contains an account of the Local Arrangements for the Hull Meeting of the British Association.

'The Whiskered Tern in Cheshire,' and 'Observations on the Twite in the Pennines,' occur in *British Birds* for September.

The Irish Naturalist for June contains 'Some Habits of the Red Admiral and Painted Lady Butterflies,' by C. B. Moffatt.

An account of the Zoological Gardens, by E. G. Boulenger, with a view of the Gardens from the air, appears in *Nature*, No. 2757.

Dr. R. F. Scharff gives 'Notes on the Irish Sheep,' and G. H. Carpenter on 'The Life-history of Warble-flies,' in *The Irish Naturalist* for July.

An illustrated paper on 'The Life-history of the Common or Fresh-water Eel,' by E. Tate Regan, F.R.S., appears in *Science Progress* for July.

E. A. Butler gives 'A Contribution towards the Life-History of *Dictyonota strichnocera* Fieb.,' in *The Entomologist's Monthly Magazine* for August.

In a note in *Nature* recently, Dr. A. Smith Woodward considers that the tooth of the 'supposed ancestral man in North America' is probably that of a bear!

The Problem of Provincial Galleries and Art Museums, with special reference to Manchester, by Lawrence Haward, appears in *The Museums Journal* for July.

'The Broadland Water-vole,' by A. H. Patterson, and 'Nesting Habits of the Long-tailed Titmouse,' by E. M. Nicholson, are among the contents of *Natureland* for July.

The Entomologist's Record recently to hand contains notes 'On some Abnormalities in Ants,' by H. Donisthorpe; and 'Formicidae: a new species and variety,' by W. C. Crawley.

No. 3 of *The Nature Lover* contains among other items, Japanese Bird Study; Notes from a Nature Lover's Diary; Gorse; Scent in the Plant World; The Hare; and the Moon.

Taxette, the organ of the Association of Women Tax Clerks, contains an occasional natural history note, and the number for July includes 'The Country in July,' by Arthur A. Thompson.

Prof. E. J. Garwood writes 'On a Freshwater Shale with *Viviparus* and Associated Beds from the base of the Carboniferous Rocks in Ribblesdale, Yorkshire,' in *The Geological Magazine*, No. 697.

The recent *Journal of Conchology*, among many other matters, contains 'Notes on the Nomenclature of *Hygromia*, *Helicella*, etc.,' by H. Watson, and 'Two Molluscan Associations in North-east Staffs,' by W. E. Alkins.

Among the many valuable memoirs in *The Journal of Ecology* for May, we notice 'The Concept of Habitat' and 'The Dovey Salt Marshes in 1921,' both by R. H. Yapp; 'The Ecology of the Gorse,' by E. G. Skipper; and 'Changes in the Coast Vegetation near Berrow, Somerset,' by H. S. Thompson. There are the papers on Spitzbergen, Greenland, and South Africa, and several plates.

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Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by
A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Oct., 1922.

505.7

NOV., 1922.

No. 790
No. 564 of current Series

THE NATURALIST

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

EDITED BY

T. SHEPPARD, M.Sc., F.G.S., F.R.G.S., F.S.A.Scot.,
The Museums, Hull;

AND

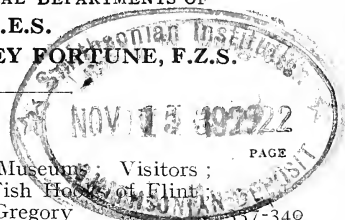
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WITH THE ASSISTANCE AS REFEREES IN SPECIAL DEPARTMENTS OF

G. T. PORRITT, F.L.S., F.E.S.

JOHN W. TAYLOR, M.Sc.

RILEY FORTUNE, F.Z.S.



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LONDON:

A., BROWN & SONS, LIMITED, 5 FARRINGDON AVENUE, E.C. 4.
And at HULL and YORK.

Printers and Publishers to the Y.N.U.

Price 1/- net. Prepaid Subscription 10/6 per annum.

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 Geological Magazine, 1894.
 Huddersfield Arch. and Topog. Society. 1st Report, 1865-1866. (38 pp.).
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 Journ. Micrology and Nat. Hist. Mirror. 1914—
 Kedgeley Naturalists' Society Journal. 4to. Part 1.
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 Peterborough Natural History Society. Reports 1-8, 11-12, 14-26.
 Quarterly Journal of Science. 1878-9, 1882-3, and 1885.
 Quekett Club Journ. 1st Series, No. 25.
 Royal Cornwall Geological Society Trans. Vol. V. to date (or parts).
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 Scottish Naturalist. 1881-1891.
 Simpson's Guide to Whitby. 1st ed., 1862.
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Apply—Editor, The Museum, Hull.

NOTES AND COMMENTS.

A ROYAL COMMISSION ON MUSEUMS.

In *The Nineteenth Century* for October, Lord Sudeley, who has the welfare of museums so much at heart, has a paper on the need for 'A Royal Commission on Museums,' which should have the approval of every one interested. He writes:—'On several occasions in recent years I have endeavoured to formulate some considerations on the public utility of museums. I am anxious now to urge that inquiry should be made by a Royal Commission to ascertain how far this great national asset is being utilised to the best public advantage. The value of the contents of our museums and picture galleries is estimated by competent authorities at no less a sum than eighty millions sterling. We spend on their annual maintenance rather more than three-quarters of a million; and it is freely stated that the nation receives neither an adequate return for this great expenditure, nor is able under the present system to enjoy its property and to learn the place of it in the history of mankind.'

VISITORS.

'The latest returns show that the museums and galleries in this country are visited annually by between nine and ten million persons. It is believed that if the resources of these treasure-houses were more fully developed, if the attractions of these stores of wonder and beauty were made more widely known, the number of those who enjoy them would be doubled and trebled. But it has been strangely difficult to arouse the Government to a sense of the educational potentialities of these collections. Four years ago it even showed itself willing to expose them to dreadful danger. The memory of the public is short; but it is not yet forgotten that in 1918 Ministers actually proposed to use the British Museum as offices for the Air Ministry, and thus to make its irreplaceable treasures and the great national library a certain mark for any hostile air raid. It is true that this dangerous proposal was made in war-time, when it was held that everything must give way to national emergency. Happily, even amid the manifold preoccupations of war the voice of the country made itself heard against so reckless a project; but it was not until the matter was brought before Parliament in the House of Lords that the proposal was withdrawn. The mere fact, however, that it was made shows how little appreciation the authorities have of what ought to be regarded as one of the most important educational agencies of this country.'

LEAMINGTON MUSEUM.

The Report of the Curator of the Leamington Museum for 1921-22 states :—‘ Notwithstanding the very modest annual income of £200 which is allowed for Museum purposes, the Committee have succeeded by gifts and loans of specimens in making such developments in recent years that a very considerable collection of interesting exhibits, properly classified and arranged, is now available to the public, and it has become not only a useful educational institution much frequented by young people, but also one of the show places for visitors to the town. The collection comprises Natural History, Ethnography, Antiquities, Local History, and the Fine Arts. There are many examples of Roman and Mediæval English Pottery which are unique and valuable. There are numerous beautiful examples of British Birds presented in their natural habitat, while the Art Section contains many fine oil and water colour paintings—many being by local artists.’

DARLINGTON MUSEUM.

The first Report issued since the new museum at Darlington was opened, states :—‘ From the opening on August 1st to March 31st, 1922, 121,200 visitors have been recorded. The best possible use has been made of the building. Unsited as it is for Museum purposes, the adaptations have overcome many difficulties and the whole now presents a very creditable exhibition. The ground floor has been used for the local and general exhibits and the first floor given up entirely to the “ Pearson Collection ” of big game. Judged not only from the number of visitors but also from the æsthetic and educational points of view the Museum must be regarded as a success. During the period November to March, Mr. F. O. D. Sibson, of the Naturalists’ Field Club, conducted a series of twelve lectures on “ Geology,” with special reference to North-Eastern England. Full use was made of the geological specimens in the Museum. The average attendance at each lecture was ten, and it is pleasing to note that those present at the first lecture continued to the end ; and the majority were artisans who had taken up the study for the first time. Arrangements have been made for a course of lectures on “ Wild Flowers,” to be given during the late Spring and early Summer months.’

FISH HOOKS OF FLINT.

The *Daily Mail* contains an announcement that the Horniman Museum has secured a rare object, namely, a fish hook of flint, which was among a collection of objects from Ireland and Greece, though it is considered that it may have originated in Denmark. We have not seen the specimen but

we should like to put in a claim in favour of Yorkshire ! In *The Antiquary* for 1908, we figured and described some excellent fish hooks of flint which had been made by a well-known Yorkshire character, 'Flint Jack.' It is difficult to understand why Neolithic Man should make a fish-hook of a brittle material such as flint, seeing that it would certainly snap before the fish could be hooked by it; especially when thorns and other suitable objects were so handy.

' THE ADVANCEMENT OF SCIENCE.'

' The Advancement of Science, 1922,' is the title given to the volume containing the addresses of the President of the British Association, and the Presidents of Sections, at the Ninetieth Annual Meeting recently held at Hull.* The addresses are :—' Some Aspects of Animal Mechanism,' by Professor Sir Charles S. Sherrington ; ' The Theory of Numbers,' by Professor G. H. Hardy ; ' The Organisation of Research, and Problems in the Carbohydrates,' by Principal J. C. Irvine ; ' The Physical Geography of the Coal Swamps,' by Professor P. F. Kendall ; ' The Progression of Life in the Sea,' by Dr. E. J. Allen ; ' Human Geography, First Principles and some Applications,' by Dr. Marion Newbigin ; ' Equal Pay for Men and Women for Equal Work,' by Professor F. Y. Edgeworth ; ' Railway Problems in Australia,' by Professor T. Hudson Beare ; ' The Study of Man,' by H. J. E. Peake ; ' The Efficiency of Man, and the Factors which Influence it,' by Professor E. P. Cathcart ; ' The Influence of the late W. H. R. Rivers on the Development of Psychology in Great Britain,' by Professor C. S. Myers ; ' The Transport of Organic Substances in Plants,' by Professor H. H. Dixon ; ' Educational and School Science,' by Sir Richard A. Gregory ; ' The Proper Position of the Landowner in Relation to the Agricultural Industry,' by the Rt. Hon. Lord Bledisloe.

SIR RICHARD GREGORY.

At the Leeds University recently a number of honorary degrees were conferred, among them being Doctor of Science upon Sir Richard Gregory, editor of *Nature*. In presenting Sir Richard, Professor Smithells stated :—' For half a century now it has been the great good fortune of British science to possess a central journal authentic for the whole wide realm of natural knowledge, acting week by week as the market-place for all who are seriously engaged in the pursuit of science. It is for his labour and leadership in this invaluable auxiliary service that Sir Richard Gregory will be first acclaimed in

* Published by the Association at 6s.

any home of science. But beyond this we have to honour him for life-long work in the cause of education, as professor of astronomy, as teacher and as author. He stands as one of the most distinguished of those who strive to interpret science to the multitude, to obliterate the false antagonisms that have arisen between the different realms of knowledge, and to win for science her rightful place among the potent influences that act for the true enlightenment and progress of mankind.'

—: o :—

'Bees and Clovers,' by A. W. Stelfox, appears in *The Irish Naturalist* for August.

'The Migrations of the Eel,' by G. P. Farran, is printed in *Discovery* for October.

Prof. A. C. Seward gives 'Impressions of Greenland's Plant Life,' in *Discovery* for September.

Prof. H. F. Osborn writes on 'Hesperopithecus, the Anthropoid Primate of Western Nebraska,' in *Nature*, No. 2756.

An illustrated account of 'The Prehistoric Boat from Brigg,' by T. Sheppard, appears in *The Mariner's Mirror* for August.

J. W. Jackson writes 'On the Occurrence of *Daviesella llangollensis* Dav. in Derbyshire' in *The Geological Magazine* for October.

Garden Life (Vol. XLII., No. 9), contains an excellent account of the Parks and Open Spaces of Hull, which are under the supervision of Mr. H. B. Witty.

Prof. Boycott writes on 'The Habits of *Limnaea glabra*,' in *The Lancashire and Cheshire Naturalist* for August. Mr. F. Williamson also writes on 'Lancashire Working-men Naturalists.'

T. B. Fletcher points out that his names *Nacoleia maculalis* have both previously been employed; therefore, presumably, the names have been altered to *Lamprosema insulicola*; other changes are also suggested (*The Entomologist*, October).

'Growth Experiments on *Spergula* and *Plantago*'; a notice of G. S. Boulger, and other items occur in *The Journal of Botany* for August. The September issue of the same publication contains 'In Memory of William Carruthers,' by G. Britten; 'Plant Nomenclature,' by J. H. Barnhart; and 'Cornish Sphagna,' by F. Rilstone.

Mr. L. Haward, writing on 'The Problem of Provincial Galleries and Art Museums' (*Museums Journal*, September), states 'It was necessary to have men of far broader views, with more knowledge of art, and greater general culture, than the men who were appointed at present, probably because they were related to a Town Councillor or the Mayor of the City.'

Among the contents of the October magazines we notice papers on 'The Ability of the Oystercatcher to open Oysters,' by J. M. Dewar; 'The Woodlark at Night,' by H. S. Davenport; and 'The Greenshank,' by N. Gilroy, in *British Birds*. Some 'Parasites of Beetles,' by C. T. Gimmingham, and 'A New Mymarid from Brockenhurst' (*Entomologist's Monthly Magazine*). 'Miscellanea Bryologica,' by H. N. Dixon; 'Linnean Species in our Days,' by E. Almquist; and 'Meristic Variation in *Papaver dubium*,' by T. A. Sprague (*Journal of Botany*). 'The Beginnings of Field Drainage,' by H. G. Richardson and G. E. Fussell; 'The Apple Blossom Weevil,' by H. W. Miles; and 'Spotted Medick,' by E. W. Fenton (*Journal of the Ministry of Agriculture*).

GEOLOGY AT THE BRITISH ASSOCIATION.

A. CHARLESWORTH, M.Sc.

SECTION 'C' may congratulate itself on a most successful meeting. It was fortunate in its President, in the character of the papers read, in the smoothness with which the excursions ran, and in the weather. Professor Kendall was at his very best, not only in his presidential address and in his presentation of the geological history of the North Sea Basin, but in his suggestive remarks on other papers. His control of the meetings was characterised by geniality and firmness, with the result that the scheduled times were always kept. All the meetings were well attended, and the papers much appreciated. We were fortunate in Section 'C' in having lecturers who, whilst being strictly scientific, presented their subject matter in such a way that people with a reasonable knowledge of geology could follow them. Facts and figures were not hurled at the audience with bewildering rapidity, but were discreetly 'doled out,' so that the listener could carry away in his mind the outstanding features of the papers. The speakers were all audible, and it is really imperative that men of scientific eminence who give public and popular lectures should bear this in mind, as popularisation of science should go hand in hand with the advancement of science. That popular lectures are appreciated was shown by the crowded audiences in the City Hall and the Royal Institution, and this phase of the British Association's activities was thoroughly justified.

Turning to Section 'C,' the outstanding features were, first, the Presidential Address on the 'Physiography of the Coal Swamps'; second, the 'Geological History of the North Sea Basin'; third, the 'Discussion on the Wegener Hypothesis of Continental Drift'; fourth, the 'Joint Discussion with the Anthropological and Geographical sections' on the 'Relation of Early Man to the phases of the Ice Age in Britain.'

In his work on the Coal Swamps, Professor Kendall has attempted to do for the coal measures what he has done for the glacial period—that is to try to reproduce the physical features obtaining at the time or times when coal formation was in progress, just as he has vividly brought before us the realities of the former presence of ice sheets and glaciers in this part of the world.

The wealth of detail gathered from workers all over the world, combined with his own vast experience made this address an epoch-making one in the study of coal measure geology. It was not a mere statement of bald facts, but was illuminated by scientific vision. The leading features of the

coal measures, the constituents of coal seams, the interferences to which coal swamps are liable (both contemporaneous and posthumous), and the phenomenon of cleat, afforded a survey which showed Professor Kendall at his best. Students of coal measure geology will welcome this address for its stimulating influence as well as for its practical value.

The discussion on the 'Evolution of the North Sea Basin' was a revelation of the width and depth of the knowledge required to tackle an apparently simple subject. The discussion embraced geology ranging from Palæozoic to recent times, and showed that a detailed knowledge of the Tertiary rocks was especially necessary. A prolonged study of all rocks bordering the North Sea area has shown that the history of the basin is a very old and long one, although the formation of the present shallow sea is a comparatively recent geological event. The evidence of the existence of a marshy plain, largely peat bog, in the southern portion of the North Sea, through which the Rhine, Weser and Thames formerly meandered, was naturally made full use of by Professor Kendall in his illustrations of coal swamps—an admirable instance of the correlation of geological studies. The physiographical aspect, as in the paper on coal swamps, was rightly made the keynote of the problem. This discussion was succeeded, suitably enough, by an admirable paper from Mr. J. O. Borley, on the 'Floor Deposits of the North Sea.' Mr. C. Thompson followed with a paper giving details of the 'Encroachments of the North Sea on the Coast of Holderness.' The North Sea lias certainly received full attention during this, the opening session. In this session, Mr. T. Sheppard rendered useful service to those who were not intimately acquainted with the geological features of the East Riding. In his own characteristic fashion, he outlined the main features of the geology of the district, and illustrated these with excellent lantern slides. Strangers to the locality much appreciated this simple yet comprehensive survey of East Yorkshire geology.

Great interest centred in the discussion on 'Wegener's Hypothesis,' as was shown by the crowded audience. The general tone was one of scepticism, and the prevailing feeling was that there is very little real evidence to support the theory. In this discussion some useful information on geological features in the Southern Seas was imparted by Professor Marshall. The joint discussion with Sections 'E' and 'H' on 'Early Man and the Ice Age' was frankly disappointing. Here was a splendid opportunity of interchanging, if not of reconciling, views upon this difficult and thorny subject. The discussion was expected to centre round the British phase of the Ice Age, but this was practically ignored, and the Continental phase of the subject was discussed most of the

time. Those who hoped for enlightenment on this matter went away confused and disappointed. More discussion on this controversial topic is certainly necessary, but with more definiteness on the points at issue, and with the very latest information available.

Local geology was represented by Mr. J. W. Stather in his paper on the New Section in the Oolites and Glacial Deposits at South Cave, where a mass of displaced Millepore Limestone is seen over chalky rubble. This section was visited during the week, and caused great interest, not to say amazement.

Mr. W. S. Bisat described the features exhibited as a result of well-sinking, boring and quarrying operations at the edge of the Wolds at North Ferriby. These gave good sections from the Middle Chalk to the Lias. The Red Chalk and Marl are shown to be resting on the Carstones. A feature of particular interest in this section is that the underlying clays have been definitely identified as Corallian, thus indicating a greater gap between the topmost Oolites and lowest Cretaceous than had been supposed to exist in Yorkshire.

A further paper was read by Mr. Bisat on the Middle Carboniferous where the limited vertical range of the Goniatites has rendered possible a greatly expanded sequence, and enabled the Millstone Grit series of North Derbyshire to be correlated with the upper part of the North Yorkshire and Lancashire series, and the Yoredale Shales of Derbyshire with the Sabden Shales of Lancashire. The Third-Grit of Lancashire and Yorkshire was thus shown by Mr. Bisat to be approximately on the same horizon as the Kinderscout of Derbyshire.

Mr. R. G. Hudson's paper on the 'Yordalian Section in Wensleydale, Yorks.' was a further example of the value of detailed palæontological work in correlating rocks by means of genera that have limited vertical range, but wide horizontal range.

The section was fortunate in having the presence of Prof. Coleman, who has done such great work in North-east Labrador. His lecture was splendidly illustrated with photographs, and his account of the work of ice in helping in the formation of fiords, deeply cut valleys and cirques, in the Archæan shield of Labrador, was of intense interest to glacial geologists in this country. One was irresistibly reminded by his photographs of the Coolin Hills of Skye on one hand and the valley glaciers and mountains round Turtegro in Norway on the other. A valuable addition to our knowledge of the geological history of the River Thames was made by Dr. Hawkins. Apparently much remains to be done before a full explanation is forthcoming of the vagaries of the course of the Thames and its tributaries.

EXCURSIONS.—Brief mention may be made of excursions. These were well attended and admirably organised, thanks chiefly to the help of the North Eastern Railway representative, Mr. P. Carr. We were fortunate in having as leaders on various occasions Professor Kendall, Mr. Lamplugh, and Mr. Stather. The excursions were to the following places: (1) The Humber Portland Cement Works at Melton, where the whole process of cement-making was shewn from the excavation of the chalk to the storing of the finished article. (2) To Market Weighton and South Cave. Near Market Weighton, at Kiplingcotes, an exposure was visited which showed Upper Chalk resting on Lower Lias. The section at South Cave previously mentioned was visited the same day. (3) Gristhorpe and Scarborough. At Gristhorpe some blasting had been done to expose more of the plant beds, and those present had the advantage of instruction by Mr. Hamshaw Thomas. A particularly successful excursion was that paid to Kirmington, where visitors had the advantage of Mr. Lamplugh's unrivalled knowledge of the district. The route was—New Holland, Kirmington, Caistor and Acre House (near Claxby), Barnetby, South Ferriby and back to New Holland—a day excursion. This Kirmington section is of great importance in its bearing upon the controversial topic of inter-glacial periods. The old ironstone workings in the Claxby Ironstone were visited. The final excursion was to Dimlington and Kilnsea, one section of the party visiting the boulder clay cliffs at Dimlington under the guidance of Mr. Lamplugh and Mr. Stather; the other section visiting Spurn, under the guidance of Mr. A. Charlesworth. The time only permitted the latter party to go half-way to Spurn Point. The erratic boulders in the boulder clay and on the shores proved fascinating. A feature which aroused great interest in a room adjoining the Section Room was the exhibition of maps showing local geological work done by members of the Hull Geological Society, and also an exhibition of lantern slides lent by members of the same society. These maps are part of the scheme for a complete survey of the East Riding, similar to that done in the South-eastern Counties and in other areas.

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CORRESPONDENCE.

DESTRUCTION OF EARWIGS.

On September 9th, I picked up a pellet ejected the previous night on to a garden path here. It measures 1.5 inches long by .5 broad, and on the surface are visible the remains of several earwigs. There were also remains of several small black beetles, and much brown substance of doubtful nature. No signs of lady birds' remains were on the pellet. What bird ejected it? Was it a Little Owl?—FREDERICK D. WELCH, M.R.C.S.

GEOGRAPHY AT THE BRITISH ASSOCIATION.

H. VIGRASS.

THE heavy programme was worked with extraordinary smoothness by the Chairman, Dr. Marion Newbegin, and the Recorder, Dr. Rudmose Brown. Fourteen papers were illustrated by slides, and the able manipulation of the lantern by Mr. Ward added appreciably to the success of the papers. The section was accommodated in an unusually fine room at the Municipal Art School, which gave ample seating room and abundant space for the exhibition of Mr. T. Sheppard's unique collection of maps of Hull and the Humber Estuary, and of a series of diagrams forming the initial stage of a regional survey of the East Riding undertaken by members of various local scientific societies.

The list of papers read was as given below :—

1. Miss E. C. Semple, 'The Influence of Geographic Conditions upon Ancient Mediterranean Agriculture.'
2. Mrs. H. Ormsby, 'The Danube as a Waterway.'
3. PRESIDENTIAL ADDRESS (Dr. Marion I. Newbegin) on 'Human Geography: First Principles and some Applications.'
4. Sir Philip Brocklehurst, 'Through Wadai.'
5. Prof. J. F. Unstead, 'The Belt of Political Change in Europe.'
6. Mr. L. Rodwell Jones, 'The Port of Hull—a Geographical Study of Port Development.'
7. Mr. C. Midgley, 'Holderness—Some Aspects of Water Supply as a Geographical Factor.'
8. Mr. H. M. Spink, 'Some Geographical Aspects of Recent Developments of Water-power.'
9. Mr. A. V. Williamson, 'Irrigation in the Indo-Gangetic Alluvium.'
10. Mr. D. T. C. Mekie, 'The Trend of World Commerce.'
11. Dr. T. Ashley, 'Early Maps of Malta.'
12. Mr. R. A. Frazer, 'Topographical Work in Spitzbergen.'
13. Mr. F. Debenham, O.B.E., 'Survey in Polar Regions.'
14. Mr. A. G. Ogilvie, O.B.E., 'The Mapping of Latin America.'
15. Discussion on 'The Use of Mercator's Projection for Air-maps.' Opened by Col. E. M. Jack, C.M.G., D.S.O.
16. Prof. P. M. Roxby, 'Peking: its Place in the Life of Modern China.'
17. Joint Discussion with Sections C and H on 'The Relation of Early Man to Phases of the Ice Age in Britain.'
18. Dr. Vaughan Cornish, 'The Isothermal Frontier of Ancient Cities.'
19. Mr. R. R. Walls, 'Portuguese Nyassaland—its Geographical Problems.'
20. Miss H. A. Wilcox, 'A Scheme for the Preparation of a Map of the Early Woodlands of Britain.'
21. Joint Discussion with Section A on 'Monsoons.' Opened by Dr. G. C. Simpson, C.B.E., F.R.S.

The President's Address was, in her own words, 'not so much a contribution to geographical science, as a plea for a deliberate attempt on the part of Geographers to make clear to the ordinary citizen that geography, in its modern aspects,

is a subject of direct interest and value to him in his daily life.'

In her customary able way, Dr. Newbegin proceeded to prove that the relations of geographical facts to each other and to the life of man are far more likely to achieve the desired end than the pure study of geographical facts. Certain points were taken showing the human response to surface phenomena and to environmental conditions; this response is communal, not individual. These points were connected up with the development of civilisation in Europe and the margins of the adjacent continents—a development which proceeded from three successive foci, each based on well-marked and distinctive geographical conditions—

- (1) The River-valley type;
- (2) The Mediterranean type;
- (3) The Forest type of Central Europe.

From these facts Dr. Newbegin worked out her conclusion that 'human geography is the biology of man, and on account of man's vast power of modifying his environment, necessitates a fuller knowledge of that environment than can be required of the biologist in the narrower sense.' Hence: 'Investigations along these lines would promote greatly the interests of Geography as a whole, both by making clear to the general public its value, and in justifying that intensive study of the surface relief and the associated phenomena which must always remain its basis.'

The Section was honoured by the presence throughout the week of Miss Semple, an American visitor, whose opening paper reflected much research. Another paper which proved extremely interesting was that of Dr. Cornish.

The only excursion arranged for the Section was to Spurn Point, on the Friday afternoon, under the leadership of the Local Sectional Secretary. A map showing coast erosion and a sheet furnishing data, copied from Mr. T. Sheppard's book, 'The Lost Towns of the Yorkshire Coast,' had been specially prepared for each member of the party. The time available did not permit the four-mile walk along the Spit to the extreme Point, but the party enjoyed a pleasant drive by char-a-banc to Kilnsea, returning by Withernsea, where a welcome and delightful tea was provided at the Queen's Hotel.

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C. B. Moffatt writes on the 'Habits of the Long-eared Bat,' and Hilderic Friend on 'Irish Enchytraeids in the Faroes,' in *The Irish Naturalist* for October.

W. G. Sheldon writes on 'The Present Value of the Principal Works on the Palæarctic Lepidoptera,' and W. J. Lucas on 'David Sharp' (with portrait) in *The Entomologist* for October.

ANTHROPOLOGY AT THE BRITISH ASSOCIATION.

E. N. FALLAIZE.

SECTION H (Anthropology) met in the Lecture Theatre of the Literary and Philosophical Society under the Presidency of Mr. H. J. E. Peake, F.S.A. Although several communications of considerable interest were presented, and some valuable discussions took place, the proceedings on the whole were not as successful as is usual in this section. This was possibly due to the fact that some papers were a little too technical or too restricted in interest to appeal to a general audience.

The President in his address, after a brief summary of the scope of anthropology in its broadest sense, and a review of the tendency of recent developments in the method of approaching its problems, suggested that the time had now come when some anthropologists might initiate a closer enquiry into the conditions of more civilized peoples as an addition to the study of primitive peoples to which attention had hitherto mainly been directed, and advocated the establishment of a School in India on lines similar to those of the Schools of Archæology at present existing at Athens and Rome.

In the Sectional proceedings, first place must be given to a discussion on 'The Relation of Early Man to Phases of the Ice Age in Britain,' which took place in a joint meeting with Sections C (Geology) and E (Geography). The discussion was opened by the President of Section H, who referred to a tentative scheme which he himself had recently published,* with a view to eliciting opinions from geologists and archæologists, and in the hope that it might be possible to arrive at some scheme which would bring the views of the monoglacialists in this country into relation with the views of Penck and others as to conditions on the continent during the Ice Age. Those who took part in the discussion were sharply divided into two camps. On the one hand Prof. Kendall and Prof. P. H. G. Boswell strongly maintained that attention should be confined to the evidence to be found in this country and the solution of the problem sought in East Anglia, while Mr. Hazzledine Warren contended that the conformity of palæolithic gravels with holocene alluvium excluded the possibility of their having been subjected to glacial influence. On the other hand, Prof. Sollas, after a brilliant resumé of the continental evidence, held strongly that Britain could not be considered apart from this evidence. Prof. Fleure, after pointing out that it was unthinkable that a change in the distribution of ice in any one of the three areas

* *Man*, 1922, No. 5.

of glaciation—Scandinavia, Britain, and the Alps—would not be followed by a change of climate and ice-distribution in the others, outlined some of the conclusions reached on archaeological grounds for which the support of geological evidence was needed. Mr. L. S. Palmer gave an account of some recent investigations on the South Coast of England which had been directed to the elucidation of the relation of climate, deposits and types of culture. The results were capable of equation with Penck's system of classification.

Prehistoric archæology was well represented in the programme. In addition to the Ice-Age discussion, M. le Comte de St. Périer discussed the question of the presence of the *Unio* and *Anodonta* in prehistoric stations, pointing to the frequency of their occurrence in the early phases of the Neolithic Age and their absence from Palæolithic sites. He also described a small statuette of a female of Palæolithic Age, comparable with those from Brassempouy and elsewhere, which he had recently discovered in the South of France. Miss N. F. Layard described pre-historic cooking-places in Norfolk attributed to the early Bronze Age. Messrs. E. K. Tratman and J. A. Davies gave an account of some important excavations in caves in the Mendips, undertaken by the Spelæological Society of the University of Bristol, which had brought to light implements of the Aurignacian and Magdalenian cultures, as well as remains of the Iron Age. An interesting and valuable contribution by Dr. Cyril Fox dealt with the distribution of population in the Cambridge area in early times, with special reference to the Bronze Age, and traced its relation to the gradual clearing of forested areas. Lord Dunsany and Mr. H. W. Seton-Karr described flint implements recently discovered in the Sahara and other parts of North Africa.

One session of the Section was devoted to the archæology of the East Riding and adjacent areas. This opened with an exhibition and description by Mr. Leslie Armstrong of two bone harpoons discovered in Holderness, which have been assigned to that late phase of palæolithic culture known as Maglemose. The remarkable state of preservation of these relics gave rise to a lively discussion, in the course of which Mr. T. Sheppard openly questioned their authenticity, and Mr. O. G. S. Crawford, while accepting them as genuine, asked for further investigation of their age by excavation on the site on which they are said to have been found. Mr. W. Collingwood gave an account of Tenth Century Art in the Danelaw, very fully illustrated by lantern slides showing examples of sculptured stones. He suggested that the Danes, who settled in Northern and Eastern England about A.D. 900, adopted much of what they found there. Debased traditions of Anglian art were

followed for a time, but on the establishment of the Viking kingdom at York, with connections with Ireland, Celtic motives were brought in, and Danish taste gradually prevailed, creating the Anglo-Danish style of ornament, seen especially in East Yorkshire. Professor A. Mawer dealt with place-names and ethnology in the East Riding. He found that the place-names of the East Riding were almost exclusively English or Scandinavian, and showed little trace of any Celtic element. It is probable that some common Anglo-Scandinavian speech prevailed over the whole area, and down to the thirteenth century there is evidence of the use of alternative English and Scandinavian forms of the same name.

Mediterranean Archæology was well represented; Mr. Stanley Casson gave an account of his recent archæological discoveries in Macedonia, which, when subjected to further analysis, may be expected to add much to our knowledge of the Bronze and Iron Age culture of this area; and Dr. T. Ashby described some supplementary excavations, which he had undertaken at the request of Dr. Zammit of Valetta, in the megalithic ruins of Hal Tarxien in Malta. These excavations confirmed Dr. Zammit's conclusions as to the relative age of the different portions of the buildings. Dr. Ashby also reported on recent archæological discoveries in Italy, which include further features of interest from Ostia, throwing light on the domestic life of ancient Rome, and discoveries on the site of Horace's Sabine farm. He also gave the results of an examination of the course of the Via Flaminia from Rome to Rimini—the most important land route to North Italy and the rest of Europe. Mr. Casson described three remarkable statue bases recently discovered in Athens, of which the sides are sculptured in relief with representations of games and amusements of the Athenian youth previously unknown. Mr. J. Whatmough gave an account of some inscribed fragments of Stagshorn from North Italy. These come from a pre-Roman site, about twenty miles north-west of Vicenza, associated with a temple or sanctuary on a hill-top. The fragments, presumably votive offerings, are inscribed in an alphabet which is clearly derived from the North Etruscan alphabet, but the language is not Venetic or Etruscan; it may be Indo-European. The character of certain votive offerings appears to indicate an Artemis cult—a fact which strengthens the suggestion of a northern origin for this cult.

In Ethnography, Mr. E. Torday, in a valuable communication, discussed the mutability of custom among Congo tribes, in which he said that, notwithstanding a remarkable conservatism among some tribes, others borrow freely from one another. A communication presented on behalf of Dr. W.

Mersh Strong showed some interesting examples of rock drawings from New Guinea.

Physical Anthropology was represented by one paper only. Prof. W. J. Sollas described a new method in comparative craniometry and its application to *Homo neanderthalensis*. He claimed that by finding the centre of gravity of a diagram of the skull it was possible to effect a division into sectors available for purposes of accurate description and comparison.

In conclusion, reference must be made to the interesting and important discussion on 'Mental Character and Races,' which was opened by Prof. J. L. Myres in a joint session with Section J (Psychology). Prof. Myres said that mental qualities were inherited just as physical, and it might therefore be assumed that they stood in some direct relation with the nervous system. Some mental qualities seemed to be associated with physical. Some physical qualities were racial, others, like red hair, appeared to result from crossing. It was possible to enhance and combine mental qualities as was shown in the breeding of domestic animals such as the dog. Racial types were characterised by mental as well as physical qualities, but it was necessary to discriminate between the purely psychological reaction and the social cultural element. Dr. C. S. Myers, President of Section K, said the two principal influences on mental character were heredity and environment. Appearance was often misleading, as in the case of handsome individuals who were mentally deficient. Different countries developed different types, as, for example, could be seen in the Americans, the New Zealanders and the Australians; and also different parts of a country showed different characteristics, as in the case of the musical talent of Yorkshire and Wales. Mr. Fallaize referred to the persistence of mental characters as shown in the records of chroniclers and older historians, whose characterisations of different peoples often held good today; and Dr. Shrub-sail referred to the differences observable in London schools attended by half-castes who, though living under similar conditions, exhibited marked differences in temperament and habits from their school-fellows in such matters, for instance, as their disposition towards play. Dr. Cyril Burt said that mental differences seem to be inherited in much the same degree as physical. Tests of intellectual ability applied in different countries showed small but distinct and constant differences; but individual differences tended to swamp group differences. Temperamental type might be associated with racial type. For instance, the so-called 'objective' type might be characteristically associated with 'Nordic' physical features, and the 'subjective' type with the physical features of the Mediterranean type.

PHYSIOLOGY AT THE BRITISH ASSOCIATION.

JAMES W. FRASER, M.D.

THE subject of Physiology was specially honoured at the meeting at Hull in that the President of the Association was Sir Charles S. Sherrington, the most distinguished English physiologist, who is also the President of the Royal Society.

His address on Animal Mechanism dealt largely with postural reflexes, a subject which he has made his own, but reviewed the nervous system also from other points of view.

In the Special Section for Physiology the meetings were well attended and some excellent work was done.

Prof. E. P. Cathcart, F.R.S., of Glasgow, presided, and Prof. P. T. Herring, of St. Andrew's, acted as Recorder in the regrettable absence, through illness, of Prof. Lovatt Evans.

At the opening meeting on Thursday, the first paper was by Dr. Eve of Hull, on 'Life and Energy,' which attracted much attention, and dealt with the origin of life from the point of view of the photosynthesis of carbohydrates, and possibly of nitrogenous compounds from inorganic substances.

This was followed by a paper by Dr. T. Ritchie Rodger, on 'The effect of Loud Noises on the Cochlea,' in which he showed from his own observations among boiler-makers that deafness began for the notes which predominated among the sounds in the workshop, and was often only detected by testing for these notes. Continental observers had found the same thing for workmen exposed to other loud sounds, *e.g.*, steam whistles, and the actual condition of the cochlea in animals similarly exposed showed the same effect. Reference may be made here to a paper read and to a model demonstrated by Dr. Wilkinson, of Sheffield, on the same afternoon, which showed that different parts of the cochlea reacted to different sounds. Both of these papers supported Holmholtz's theory that the cochlea is the organ for the analysis and appreciation of musical sounds.

Dr. J. E. Bannen showed diagrams of radiograms of the progress of an opaque meal through the alimentary canal.

On Thursday afternoon, after Dr. Wilkinson's paper, was one by Professor A. V. Hill, F.R.S., on 'Athletes and Oxygen Supply,' showing the curves of oxygen consumption during muscular work of varying degrees of severity.

Friday morning's meeting commenced with the Presidential Address on 'The Efficiency of Man.' Professor Cathcart did not read his address as published, preferring to use parts of it as an introduction to a discussion, in which Professor A. V. Hill and others took part. Experiments had shown that the muscular efficiency (using efficiency in the engineering sense) was high, about 23 per cent., and that even under severe fatigue it did not fall very much.

A joint discussion with the Section of Agriculture followed on 'The Vitamines,' but did not produce any novel facts.

The afternoon papers were read by Professor W. Storm van Leeuwen, of Leyden, on 'Experimental Studies in Hypersensitiveness,' and on 'The Cause and Treatment of Asthma, Hay-fever, etc.,' the chief point demonstrated being that hypersensitiveness is not specific, but if it exists for one substance, may also exist for another, not necessarily similar.

At five o'clock, Mr. Bancroft, F.R.S., the leader of an expedition to the Andean Plateau to study the effects of high altitudes, gave an account of the expedition, and of the physical conditions of the miners who work in this region in mines, the highest in the world, 14,000 feet above the sea. The most remarkable fact noted was the development of the chest to compensate for the respiratory difficulty caused by the lack of oxygen. A radiogram showed that the ribs were almost horizontal instead of sloping downwards, as in normal individuals.

On Monday morning there was a joint meeting with the Section of Physics to demonstrate and study the use of Physical Instruments for Biological purposes. The instruments shown were chiefly for testing and analysing hearing, and varied from the simple tuning fork to electrically worked instruments of great complexity only suitable for use in the Laboratory.

In the afternoon, Dr. F. W. Edridge Green lectured on 'Colour Vision Theories and Colour Blindness,' and on the 'Necessity for a Standard of White.' He showed how colour blindness may be detected by colour mixing to make white, and stated that the best standard white was magnesium oxide illuminated by the light of the tungsten arc lamp.

On Tuesday morning, the first paper was by Dr. P. M. Tolmie on 'The Blood Corpuscles, their Development and Functions.' Treating of the white corpuscles, he supported the theory that the lymphocytes acted as agents in the conveyance of proteid nourishment from the alimentary canal to the blood. In criticising this view, the President considered that the function was impossible on account of the insufficient number of the lymphocytes; but the theory was supported by Professor Halliburton, with the assumption that each lymphocyte might make several journeys. This was followed by a very intricate paper on 'The Secretion of Sweat,' by Dr. J. H. Burn, the Secretary of the Section; and the author was complimented on the excellence of the work.

The proceedings of the Section were brought to a close by a Lecture at 5 p.m. by Prof. Halliburton, F.R.S., on 'Our Bones and Teeth,' which was illustrated by lantern slides, among which were some beautiful photo-micrographs of the minute structure of the teeth.

BOTANY AT THE BRITISH ASSOCIATION.

J. FRASER ROBINSON.

THE great and ostensible function of the British Association, namely, the Advancement of Science, was certainly fulfilled at the meetings, both in and out-of-doors, of Section K (Botany). Judging by the amount of present day research and intensive study of botanical Morphology, Physiology and Ecology, as revealed by the many papers read before the Section, there can be little doubt Botanical Science has received a great impetus from the Hull Meeting. It was, indeed, agreeably surprising to find that serious work rather than merely social enjoyment was paramount from the beginning to the end of the meeting. Evidence of this may be found in the fact that while the field excursions were well attended and apparently most thoroughly enjoyed, several of the more purely social functions which had been planned on quite a large scale were not nearly so successful in the matter of attendance.

The meetings of Section K were held in the Municipal Art School, and were ably and genially presided over by Prof. H. H. Dixon, F.R.S., D.Sc., of Trinity College, Dublin, who, in his Presidential Address, discoursed very learnedly, as befitted the greatest living authority on the ascent of a sap, on 'The Transport of Organic Substances in Plants.' The Address showed that the former view taken by plant physiologists, namely, that the downward current of substances elaborated in the leaves takes place entirely in the bast, can no longer be held; for Prof. Dixon's own observations and experiments, as well as those of other noted workers, have shown that 'soluble carbohydrates, sucrose, hexose and maltose' have been detected, and to a marked degree, also in the wood, indicating unmistakably that currents do travel downwards as well as upwards in the latter.

Besides the Presidential Address on Thursday morning (7th September), others were given by Professor J. H. Priestley and Dr. W. H. Pearsall on 'Leaf Growth' considered in connexion with the water relations of apical meristems; and by Dr. I. Soar on 'The Structure of the Endodermis in some Gymnosperms.' The afternoon session was devoted to a joint discussion between Section B (Chemistry) and Section K (Botany) in which Dr. F. F. Blackman, F.R.S., spoke on 'The Biochemical Problems of Chloroplastic Photosynthesis'; Professor E. C. C. Baly, F.R.S., on 'Photosynthesis'; Mr. G. E. Briggs on 'The Efficiency of the Photosynthetic Mechanism of Green Plants for Different Wave Lengths of Incident Radiation'; and Prof. I. M. Heilbron and Dr. C. Hollins on 'Some Speculations on the Photosynthesis of Plant Products,' while Dr. F. C. Eve went into 'Photosynthesis from the Energy Aspect.' In the vigorous, general

discussion which followed, Professors H. H. Dixon, F.R.S., and R. Robinson, F.R.S., took leading parts.

Friday morning found Prof. J. McLean Thompson addressing the Section on 'The Meaning and Evolution of some Floral Characters'; Mr. J. Walton on 'The Physiological Anatomy of the Fossil Genus, *Rhexoxylon*, compared with that of some modern Lianes'; Dr. H. S. Holden and Miss Dorothy Bexon on 'The Seedling Structure of *Acer pseudo-platanus* (Sycamore)'; Miss L. Prankerd and Miss F. M. O. Waight on 'The Presentation Time and Latent Time for Reaction to Gravity in Pteridophytes'; and Dr. W. L. Balls on 'The Growth Structure of a Cell Wall,' whose conclusions in some way seemed to traverse the views of cell wall structure enunciated by Dr. Wilfrid Robinson in a paper which the latter had read before the Royal Society. This brought Dr. Robinson to his feet in the discussion, which invariably followed a paper, and for a brief period a lively little debate ensued.

Then followed Prof. A. H. R. Buller (Univ. Manitoba) on 'The Organisation of the Hymenium of the Common Mushroom and its Allies for the Production and Liberation of Spores'; Dr. Malcolm Wilson on 'The Cytology and Life-history of *Tubercinia*'; and Miss K. B. Blackburn and Dr. H. Harrison on 'The Meiotic Phase in the Salicaceæ,' from which it incidentally transpired that no longer can the willows be accounted absolutely dioecious; for in several of the species both sex organs of reproduction have been found on the same plant. Friday's full and interesting sessions were brought to a close by a paper on 'Somatic Chromosomes,' by Mr. W. C. F. Newton.

The papers were fully illustrated by blackboard and other diagrams, or by lantern slides; while practical illustrations were copiously afforded by microscopes, micro-preparations, and fresh and dried plants, in a separate room specially set apart for the purpose—a feature which, it was said, was more prominent at the late meeting than had been usually the case previously. Further, in this connexion it was most gratifying to notice how Associates (of the Botanical Section particularly) visited and highly appreciated the admirable Exhibition by the Yorkshire Naturalists' Union, of the natural history resources, products and survey work of the local societies of Yorkshire.

On Saturday, 9th September, and following day, work indoors was suspended for field operations.

The Monday morning session, 11th September, was devoted to a Joint Discussion between Section K (Botany) and Section D (Zoology), which took place before a large audience in Queen's Hall, the subject being 'The Present Position of Darwinism.' Dr. J. C. Willis, F.R.S., opened,

and spoke of 'The Inadequacy of the Theory of Natural Selection as an Explanation of the Facts of Geographical Distribution and of Evolution.' This was supported in 'A Mathematical Conception of Evolution based on the Theory of Age, Size and Space,' by Mr. G. Udny Yule, F.R.S. The addresses of Mr. C. Tate Regan, F.R.S., Prof. W. Johannsen (Copenhagen), and Mr. J. T. Cunningham, the last of whom spoke on 'The Origin of Species and Origin of Adaptations,' as well as the speeches of Dr. Harold Wager, F.R.S., Dr. Chalmers Mitchell and others in the general discussion which followed seemed to leave the 'Age, Size and Space' theory somewhat cold.

The afternoon session of Monday again brought up Prof. J. H. Priestley to the platform of Section K Room, on this occasion taking as subject 'The Endodermis: a Study in Causal Anatomy,' in which Prof. Priestley further expounded his well-known work on the origin, structure and significance of the endodermis. This was followed by Dr. Wilfrid Robinson and Mr. H. Walkden on 'Critical Observations on "Crown Gall" in *Chrysanthemum frutescens*,' in which it was shown that the similarities that have been supposed to exist between 'crown' gall and malignant tumours are more apparent than real. The session included a fine address by Prof. R. Ruggles Gates on 'Size Inheritance in Plants and Animals,' and was immediately followed by a 'Popular Lecture on Moulds,' by Professor Dame Helen Gwynne-Vaughan, D.B.E., which proved to be full of interest, especially when dealing with Dame Helen's own able research work on Moulds. The lecture was a model of demonstration and delivery, and was finely illustrated by a large number of lantern slides.

The session of Tuesday morning gave an opportunity to one of the Vice-Presidents of Section K, the Rt. Hon. Lord Lovat, K.T., to deliver himself of a very able, interesting and searching examination of 'The Position of British Forestry To-day.' Lord Lovat spoke of 'the lack of a forestry conscience' in Great Britain and the reason why; of State Forestry, its advantages and disadvantages; of the difficulties which beset the path of progress; and of the necessity of the nation getting a better grasp of forestry values based on exact knowledge without which there could be no ordered progress. Dr. A. W. Borthwick supported, with a contribution on 'Farm Forestry,' and Prof. A. Henry with a paper on 'The Cultivation of Poplars,' while others took part in the general discussion afterwards. Tuesday afternoon saw a goodly contingent of botanists at the excursion to Skipwith Common *via* Selby.

On Wednesday morning (13th September) the final sectional session was held and, somewhat remarkable to relate, there was a large attendance of members, as well as a full

quota of addresses, all bearing on problems of botanical research and of great interest. Dr. W. R. G. Atkins dwelt upon 'Some Physical and Chemical Factors which affect Plant Distribution'; Prof. J. H. Priestley and Dr. J. Ewing on 'Etiolation'; Miss Margery Knight on 'Nuclear Changes in Relation to Different Methods of Reproduction in the Ectocarpaceæ'; Prof. J. C. Schoute (Gröningen, Holland) on 'The Foliar Origin of the Internal Stelar Structure of the Marattiaceæ'; and Miss Violet M. Grubb—'Notes on the Reproduction of Certain Members of the Rhodophyceæ,' which constituted an important contribution to our knowledge of the red seaweeds, *Porphyra* and *Rhodymenia*.

As regards 'field' days or excursions, there were three, in all of which many botanists joined, evidently with enthusiasm, profit and enjoyment. The first was for the whole day (9th September) to Welwick on the Humber shore, for investigation of its very fine bit of salt marsh which exists there; and then to Spurn for the sand-dune vegetation, in which Sea Holly and the richly orange-fruited Sea Buckthorn were conspicuous. The party of ninety on the return journey halted at Easington, where the catering capacities of mine host and hostess of the 'Neptune Inn' were somewhat taxed in providing 'a substantial tea,' which, however, was satisfactorily accomplished to the letter, in two or three relays.

Good weather had favoured Saturday's excursion; but nothing could have been more glorious than that of the day following, when the second excursion—limited in number to twenty-five—took place, per char-a-banc, to Elloughton and Brantingham dales. After the plants of the chalk had been closely scrutinised and at least two new records made for E. R. Yorks., the party was regaled to Afternoon Tea at Brantingham Hall, the beautiful residence of Sir John and Lady Sherburn, whose geniality and kindly hospitality could not have been greater or more opportune than upon this occasion. High appreciation of their kindness on behalf of the party was voiced by the President of Section K, Professor H. H. Dixon, D.Sc.

After the clay of Holderness and the chalk of the Wolds it was fitting that the final excursion which took place on Tuesday afternoon, 12th Sept., should be to the sandy commons of Skipwith and Riccall. A party of forty-five, under the guidance of Messrs. W. N. Cheesman, J.P., Selby, and Hy. J. Wilkinson, York, did this very satisfactorily. Rain, however, came on and sent the botanists back to Selby for a fairly early tea, after which—again under the able guidance of Mr. Cheesman—they made a most instructive and interesting inspection of the interior of the famous Abbey.

ZOOLOGY AT THE BRITISH ASSOCIATION.

C. F. PROCTER.

To a layman, perhaps the outstanding interest of the work of this section was (1) the penetration of what might be pardonably called the curtain of Professional Science; (2) the light that was shewn on the means whereby a small proportion of organised and systematised thought determined the trend of knowledge, as against the huge volume of independent and uncollated research work by the 'dilletante' scientist; (3) the new ground that was broken in every direction of zoology, and the ever-increasing use that is nowadays made of quantitative investigation, as exemplified by the preparation of the universal chart, to prepare the way for the qualitative side.

It appears merely to be a matter of arithmetic to determine the plane of excellence that successive British Association meetings may reach, since we live in an age when scientific thought is not merely investigating scientific problems, but is applying a very fair proportion of its experience to developing the actual means of investigation. The natural result of this is that the time of these annual meetings is in ever-increasing demand, and that the tone of the matter read and debated is constantly ascending. As befits an Association for the Advancement of Science, ample provision was made, not only that the matter should not be over the heads of a public of average intelligence, but that the rising school of savants was encouraged by a liberal allocation, in the programme, of time to aspiring students.

The importance of the fishing industry to the Humber was perhaps responsible for a little extra prominence being given to marine biology and cognate subjects than would otherwise have been the case. A perusal of the titles of the papers well indicate this.

Dr. Johannes Schmidt opened with 'An Account of the "Dana" Expedition in the North Atlantic.' Dr. C. G. Joh. Petersen, Mr. F. M. Davis, Mr. I. O. Borley, Professor R. D. Laurie, Miss E. Horsman, Mr. E. E. Watkin and Dr. Alexander Bowman contributed papers relating to recent investigations of the forces affecting the food reserves of the sea—currents, temperatures, fauna and their inter-relations, and the effects of these on the plankton and peridineans. Mr. I. A. Robertson, Dr. E. S. Russell, Mr. H. G. Maurice, Professor J. Stanley Gardiner, F.R.S., Mr. G. Hall, Mr. David Jones, Prof. Otto Petersen, Mr. B. Storrow, Dr. Wm. Wallace all gave papers or addresses on the subject of Sea Fisheries, with special regard to the herring industry, and every phase of the subject was covered in a most engrossing fashion.

There was, in addition, a record concentration of fishery research vessels.

The presidential address of Dr. E. J. Allen, F.R.S., of the Marine Biological Laboratory, Plymouth, was a fine addition to the philosophy of Biology, rather than a laboured array of systematised facts, but it was the more welcome on that score alone. He dealt with much imagination and reasoned argument on the most probable sequence of natural phenomena that our present-day knowledge can afford us, and applied this to the old problem of zoological progress in the sea. The result was a notable addition to our literature on this subject. The rest of the papers were of a very high character, but it would be impossible to review them even in a general sense.

Nowadays, although the qualitative aspect is never a bit neglected, still it almost invariably starts from a curve of some data or other. It appears to me that this is an exceedingly sound basis as a rule, and some extraordinary and unsuspected facts are thus made evident, but the difficulty commences when the deductions are to be made. It is here that the food for discussion is found, and although the formation of the curve is nearly always a non-debatable matter, yet the conclusions therefrom are generally fertile ground indeed for argument. This was well exemplified in a joint discussion which took place with the Botany Section on 'The Present Position of Darwinism.' In the course of this, Dr. J. C. Willis, Mr. G. Udny Yule, F.R.S., Mr. C. Tate Regan, F.R.S., Prof. W. Johannsen, Mr. I. T. Cunningham, and Dr. H. Wager, F.R.S., found ample space to disagree, but a more entertaining or educational series of passages it would be difficult to find than this subject afforded. The value of systematic recording and patient charting of one's experience was exceedingly well brought out at this meeting. Mr. A. M. Carr-Saunders, 'Problems of Geographical Distribution in Spitzbergen'; Prof. A. Meek, 'The Fate of the Segmentation Cavity in the Frog's Egg'; Prof. E. B. Poulton, F.R.S., 'Experimental Evidence for the Hereditary Transmission of Small Variations such as would be required to initiate a Mimetic Resemblance in Butterflies' (this is the title only); Mr. C. Tate Regan, F.R.S., 'Some Examples of Adaptive Evolution in Fishes'; Dr. W. R. G. Atkins, 'The Hydrogen ion Concentration of Soils and Natural Waters in relation to Animal Distribution'; Dr. G. P. Bidder, 'The Relation of Sponge forms to their Currents'; Mr. J. Gray, 'The Mechanism of Ciliary Movements'; Miss K. Carpenter, 'Fresh-water Fauna and Lead Pollution'; Mr. Julian S. Huxley, 'Time Relations in Amphibian Metamorphosis'; Dr. F. A. E. Crew, 'Developmental Inter-sexuality in the Domesticated

Mammals'; Dr. A. Smith Woodward, 'The Rhodesian Skull'; Miss Dixon, 'Periodicity in Protozoan Fauna,' and Dr. J. W. Munro, 'The Natural History of the Large Pine Weevil,'—all these, though appearing as titles only, have a very real value as indicating the great range that investigation now covers. Most of these were bold incursions into the deep water of science by men holding reputations of international weight. One of the most engrossing sidelights, on evolution and the development and mutation of species, is found in the study of hormonal secretions. Their importance and functions appear to be the greatest addition to Zoological Science that has been made of recent years. When we thoroughly understand the processes of their activity, many of the present problems of biology will disappear, and we may very well wonder what will be the position of this branch of knowledge if the present rate of progress continues for another ten years.

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Handbook to Hull and the East Riding of Yorkshire, edited by **T. Sheppard, M.Sc., F.G.S.**, pp. 532, plates and figures. London and Hull: A. Brown & Sons, Ltd., 1922. Price 5s. 9d., post free. Not the least of the benefits due to the meetings of the British Association, is the preparation of a series of Handbooks, descriptive of the places which it visits; many of these books have a permanent value. The one under notice, prepared for the members who attended the recent meeting at Hull, is an admirable illustration of what such a handbook should be, as could be naturally expected, when undertaken by so accomplished and experienced an editor. A review in *The Naturalist* will naturally deal with that part of the handbook which treats of natural history studies, but mention may be made of the interesting chapter on the 'Rise and Progress of the City and County of Kingston-upon-Hull,' by the late Sir Albert Kaye Rollit, who died while the book was being printed. Some of the articles are signed; others not; and we gather from the preface that the latter were penned by the Editor. The brief description of his work on 'The Lost Towns of the Humber' is welcome. Archæology, geology, zoology and botany are treated in articles of varying length. Some are largely lists of names, others give interesting information on ecology and other matters. The archæological chapters treat of relics of various ages, and one is struck with the rich yields of so many different periods, from prehistoric implements to tradesmen's tokens and tobacco-pipes. The latter have been manufactured in Hull since the seventeenth century. The geological chapter is instructive, but somewhat brief. The various articles devoted to the groups of the animal kingdom are specially marked by their varying length, thus only 10 pages are assigned to the marine mollusca, and 27 to those inhabiting land and freshwater. Such inequality is obviously unavoidable in a work of this nature, but the treatment of habitat in the article on the marine mollusca is so suggestive, that one wished for fuller information. A good deal of matter concerning ecology is included in the chapter upon the Botany of East Yorkshire. A concluding chapter on the Rainfall of the Riding is from the pen of Dr. Mill, and no further comment is necessary. The handbook is well got up, with admirable illustrations. It will be for a long time to come, the authoritative guide to the Riding, so far as history, archæology and natural history are concerned, and the editor must be heartily congratulated on the result of his evidently laborious task.—J. E. MARR.

YORKSHIRE NATURALISTS' EXHIBITION AT THE BRITISH ASSOCIATION.

W. R. GRIST.

The Yorkshire Naturalists' Union is to be congratulated on the excellent exhibit given by its members at the Hull Meeting of the British Association. A brief reference was made in the last number of *The Naturalist*, but it has been thought that such a successful experiment merited a permanent record in the official journal.

The main purpose of the exhibition was to present a bird's-eye view of some of the results of the organised scientific investigations of the various research sub-committees of the Union. Such a show is not a mere collection of 'specimens' arranged in a more or less haphazard fashion. In this case the exhibits were grouped under the various sectional activities, and were arranged to demonstrate the lines on which research work is being pursued. The following notes indicate the general arrangement and scope of the exhibition, and some idea of the appearance presented will be gathered from the illustrations showing two corners of the exhibition room.

YORKSHIRE COMMITTEES OF RESEARCH & THEIR EXHIBITS.

SECTION A (GENERAL BIOLOGY) :—

(a) *Marine Biology Committee*.—(1) Exhibits of Living Marine Organisms from the Yorkshire Coast, by the Committee ; (2) Marine Tube-building Worms, Mr. Arnold Watson, Sheffield.

(b) *Micro-Biology Committee*.—Diagrams based on Mr. R. W. Butcher's examination of the Wharfe phytoplankton as illustrating that of one of the cleaner Yorkshire rivers. Monthly collections have been taken from this river at Harewood Bridge since January, 1921, along with data as to hardness, turbidity and water-level. The exhibit showed the relation of algal phases to habitat conditions.

SECTION B (VERTEBRATE ZOOLOGY) :—

The Wild Birds and Eggs Protection Committee and The Yorkshire Mammals, Reptiles, Amphibia and Fishes Committee.—Exhibits : Photographs of Yorkshire Birds—(1) Summer Visitors, arranged in sequence of arrival ; (2) Resident species, with photographs of favoured localities ; (3) Winter Visitors, in sequence of arrival, with notes and illustrations as to favoured haunts ; (4) Birds of Special Habitats.

(a) *Mammals, Amphibians, Reptiles and Fishes Committee*.—Yorkshire Mammals and Amphibians : Exhibits arranged on similar lines to those outlined above for birds ; Yorkshire Fisheries : The illustrations of fishes were grouped to show how the various species affect different portions of a river :—(1) Estuarine ; (2) Slow reaches above tidal influence ; (3) Lower reaches with rapids and weirs ; (4) Rapid waters and upper stretches.

Illustrations were provided by Messrs. Riley Fortune, Jasper Atkinson, E. W. Taylor, Ralph Chislett, W. Fowler, F. Vear and S. H. Smith.

SECTION C (CONCHOLOGY) :—

Exhibit illustrating the variability and structure of the Mollusca of the County, by Mr. J. W. Taylor. Three frames of original drawings : (1) Varieties of *Helix aspersa*, showing natural colours, together with ink drawings of internal organisation ; (2) and (3) Colour Variations in the British land shells ; (4) The distribution over the globe, indicating approximately the relative dominancy of the different species as well as the chief evolutionary centre from which the most important forms arose.

SECTION D. (ENTOMOLOGY) :—

(a) *Yorkshire Coleoptera Committee*.—Exhibits : (1) North Yorkshire Coleoptera, by M. L. Thompson. This exhibit emphasized the sub-alpine character of the beetle fauna of the extensive moorland tracts of North Yorkshire. Specimens of coleoptera peculiar to the coast line were also shown. (2) *Trogoderma Khapra* Arrow, a Grain Pest (an addition to the British list of breeding Coleoptera), by F. A. Mason, Leeds.

(b) *Hymenoptera, Diptera and Hemiptera Committee*.—Exhibits : (1) 'Cuckoo' Humble-Bees and their Hosts, by A. E. Bradley, Leeds ; (2) Diptera of Spurn Point, by Mr. C. A. Cheetham, Leeds. This exhibit was a small collection of Diptera taken on the occasion of the Yorkshire Naturalists' Union Meeting at Spurn Point, August, 1919. (3) Chironomidæ and Bibionidæ of Yorkshire, by Mr. J. H. Ashworth, St. Annes-on-Sea. (4) Yorkshire Syrphidæ, by Mr. Rosse Butterfield, Keighley. (5) Woodlice of Yorkshire, by Mr. F. Rhodes.

(c) *Lepidoptera Committee*.—Exhibits : (1) Melanic Lepidoptera, by Mr. Rosse Butterfield, Keighley ; (2) Hand-coloured figures of Varieties of Butterflies and Moths, by Mr. S. L. Mosley, Huddersfield.

(d) *Yorkshire Arachnida Committee*.—Exhibits : Harvestmen, False Scorpions and Mites of Yorkshire, by Mr. W. Falconer. This exhibit dealt with the three least known of the four orders, the harvestmen, false-scorpions and mites, typical specimens of those only which have already occurred in Yorkshire being shown.

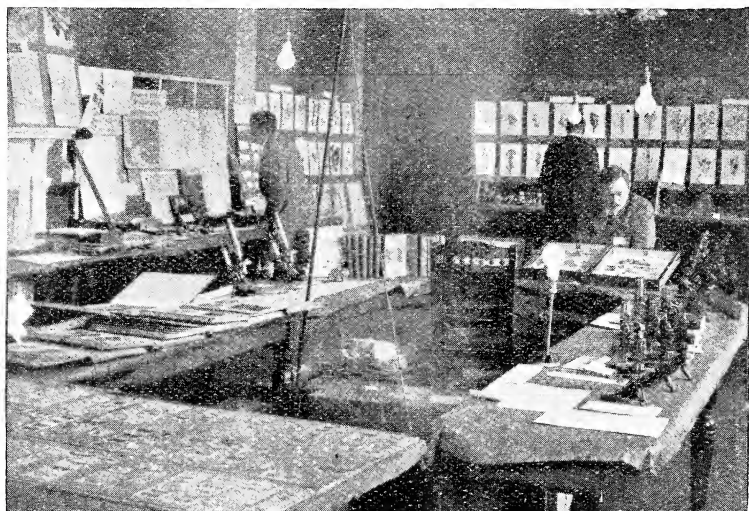
SECTION E (BOTANY) :—

(a) *Botanical Survey Committee*.—(1) Regional Survey of the Huddersfield District, by Dr. T. W. Woodhead. The basis of this survey was a study of the plant associations of part of the Southern Pennines, with Huddersfield as a centre. It considered the present and past distribution of man in relation to the distribution of the flora and fauna. It shewed how man's activities have been determined in this district by the action of his environment. The area covered was about 250 square miles. A series of about 10 maps and models was shown illustrating the influence of these factors and their inter-relations. (2) Escarpment and Terrace Map, by Mr. W. S. Bisat. (3) Botanical Survey Maps and Diagrams with Explanatory Notes, by Dr. Wm. G. Smith : (i.) Diagram of Types of British Vegetation ; (ii.) Two Field Sheets of the West Riding of Yorkshire ; (iii.) Two Field Sheets of North-east Yorkshire ; (iv.) Two Half-inch Scale Published Maps of the West Riding. These maps were of the first English vegetation survey, and include two which have not yet been published. Additional diagrams summarised the effect of slope and of the underlying rocks upon the vegetation. (4) Topographical Relations of Woodlands, by Dr. W. H. Pearsall. These diagrams illustrated the development of woodlands in different stages of valley formation on the Yorkshire limestones. The general succession is, roughly : Scrub-Elm—Ash—Oak. (5) Interesting Yorkshire Plants, shown by Messrs. J. F. Robinson, C. Waterfall and R. W. Butcher.

(b) *Plant Galls Committee*.—Exhibit of Plant Galls, by Mr. W. Falconer : I.—Galls of Economic Interest :—(1) Destructive Fungus Parasites, (i.) Witches-brooms—Photographs ; (ii.) Fruit Diseases—'Bladder Plums' ; (2) Flies Destructive to Crops, *Oscinis frit* Linn. II.—Illustrating Other Special Lines of Enquiry : (1) Neglected or overlooked species ; (2) The Cynipidæ of the oak, with their inquilines and parasites ; the phenomenon of parthenogenesis ; (3) Plant deformations due to agencies hitherto unrecognized in this country, such as *Aphrophora spumaria* or parasitic fungi.

(c) *Bryological Committee*.—(1) Slides prepared by the late R. Barnes, of Harrogate, in his study of peristomes, show the high standard of manipulative skill attained in this work. (2) Mosses of an Oak Wood on

the Millstone Grits near Huddersfield, Mr. J. R. Simpson. A study of the moss flora of Hagg Wood, Honley, near Huddersfield, together with



Sections of the Yorkshire Naturalists' Union's Exhibits at Hull.

notes on their distribution within the area. The wood covers an area of 61 acres, and is a typical *Quercus sessiliflora* wood of the Southern Pennines (altitude, 350-550 feet O.D.). (3) 'Mosses of West Riding Streams,' by Mr. C. A. Cheetham and Mr. W. H. Burrell. Comparison of

Distribution of some aquatic and semi-aquatic mosses in the watercourses of millstone grit and limestone areas : Species characteristic of Water rich in Lime : *Weisia verticillata*, *Hypnum commutatum*, *Hypnum virescens*. Species characteristic of Water poor in Lime : *Rhacomitrium aciculare*, *Hycomium flagellare*, *Brachythecum plumosum*, *Hypnum ochraceum*. (4) The Moss Flora of an Industrial City, by Mr. W. H. Burrell. (5) The Oil Bodies of Liverworts, by Mr. F. E. Milsom. Microscope slides showing oily masses of various sizes suspended in the cell-cytoplasm of liverworts. Their composition is commonly a fatty oil sometimes mixed with essential oil.

(d) *Yorkshire Mycological Committee*.—Exhibits : (1) The survey work of the Committee by means of a map and flora, and contributions to the literature of mycology by Yorkshire workers, commencing with Bolton's 'History of Fungusses Growing About Halifax,' written in 1775. (2) Photographs of groups of members taken at Forays (A. E. Peck and others). These have a bearing on the history of the Committee and on the inauguration of the British Mycological Society, which was founded at a meeting of the Yorkshire Naturalists' Union at Selby in 1896. (3) Photographs of Fungi, A. E. Peck. (4) Stereo photos of Fungi, A. Clarke. (5) Drawings of Fungi, Sir Henry Hawley, Bart. (6) A Series of Lantern Transparencies of Mycological interest. (7) A Collection of Parasitic Fungi mounted as museum specimens. (8) A Tridimensional Graphic Key to Genera of the Agaricaceæ, F. A. Mason.

SECTION F (GEOLOGY) :—

Exhibits by Mr. H. C. Versey, M.Sc.—(1) Specimens and Microscope sections illustrating the Petrography of the Millstone Grit of Yorkshire, by Prof. A. Gilligan ; (2) Map showing the position of the small folds in the Yorkshire Chalk and their position in alignment with certain of the pre-cretaceous folds seen in the Jurassic rocks to the west ; (3) Microscopic slides and specimens illustrating the mineralogy and petrology of the sandstones and conglomerates of Permian age in Yorkshire.

(a) *Geological Photographs Committee*.—Exhibits : Volumes of Geological Photographs of Yorkshire.

(b) *Yorkshire Glacial Committee*.—Exhibits : Maps showing distribution of Erratics and Drift in Yorkshire.

(c) *Yorkshire Coast Erosion Committee*.—Exhibits : Maps and Photographs illustrating Coast Erosion in Yorkshire.

(d) *Carboniferous Rocks, Fossil Flora and Fauna Committee*.—(1) Exhibit by Mr. W. S. Bisat, Hull. A series of goniatites shewing the species characterising (in Yorkshire) the various zones of the Carboniferous Rocks from the Mountain Limestone up to the Lower Coal Measures. (2) A specimen of Calamites, exhibited by Miss M. A. Johnstone. (3) Exhibit by Mr. W. R. Barker, Barnsley : (i.) Marine shells from horizon of the Mansfield Marine Band, 1,080 feet above the Barnsley coal, from claypit at Monk Bretton, Barnsley ; the exposure, which shews soft shales with marine fossils on a thin limestone, is notable as greatly extending the known horizontal extent of this important marine band. (ii.) A new plant from the same locality, 15 feet below the Marine band. (iii.) A rare crustacean, *Anthropaloeon*, from shales over the Tankersley Ironstone.

(e) *Jurassic Flora of Yorkshire*.—Exhibit of work in the Yorkshire Jurassic Flora by Mr. H. Hamshaw Thomas, M.A., Pembroke College, arranged to show (i.) New Methods of Study of the Material ; (ii.) The elucidation of the affinities of the plants by the discovery and study of their reproductive structures ; (iii.) Evidence of Angiosperms in Jurassic Times ; (iv.) Some recently discovered genera and species new to science ; (v.) The geographical distribution of plant beds in Yorkshire, with specimens from the recently discovered beds in the Cleveland District. Mr. Thomas demonstrated new methods of obtaining undamaged speci-

mens of fossil plants. These enable the general appearance of the plant itself to be examined rather than that of a cast or impression, and also permit sections to be prepared and examined from fragmentary material. New fossil species described by the aid of these methods were shewn in illustration.

Committee of Suggestions for Research.—Peat Investigation Work : Maps showing the Distribution of the Remains of Early Man on the Southern Pennines. Flints of the Pennine Moors and their relation to the Peat of S. W. Yorkshire : (1) Pennine Peat, by C. A. Cheetham and W. H. Burrell, exhibits illustrating a study of upland peat during recent years showing that—(i.) Pan formation preceded accumulation of deep moor peat ; (ii.) *Juncus communis* L. entered largely into the composition of the early vegetation ; (iii.) *Eriophorum vaginatum* L. is the plant of outstanding importance in peat formation. Photographs of the organisms commonly found in peat were exhibited. An interesting feature of many peat samples is the presence of the recently identified spermatophores of the Copepod. (2) Studies in the Distribution of the Primitive Pennine Forest, by Dr. T. W. Woodhead. This exhibit consists of specimens of tree remains found beneath the peat on the Southern Pennines in the District of Huddersfield. (3) Diagrams illustrating the Effect of Topography on Peat Formation and Woodland Destruction, by Dr. W. H. Pearsall. (4) The Physiological Anatomy of Plants growing upon Peat, by Prof. Priestley and Miss Mildred Hinchliff. Microscopic slides of typical plants from a Yorkshire peat moor, showing that these plants are characterised by excessive deposits of fat in their tissues, with consequent effects upon their structure (see *The Naturalist* for September, 1922).

An important supplementary exhibit was a fairly complete collection of the Publications of the Union, including a long run of *The Naturalist*, the Transactions, Excursion Circulars and Secretaries' Reports. With the Transactions were shown such important monographs as Baker's 'North Yorkshire' and Lee's 'West Yorkshire.'

—: o :—

The Local Programme of the British Association at Hull, 1922. 72 pages, with map, 11 plates and various illustrations. Sold by A. Brown & Sons, Limited, Hull. Price 1s. 3d. post free. This is distinctly the best and most useful programme of its kind we have seen for a long time, and reflects the greatest credit on its Authors and Editor. Nearly half of it is taken up with an admirable account of the Yorkshire Naturalists' Union and its Work, in the course of which, what has been done, and is being done, by the various Sections, and all the large number of Committees is so clearly set forth, that the members of the British Association could not fail to grasp, from the enormous amount of original investigation which has been achieved in the county by so many members of the Union, and which was evidenced by the fine exhibition illustrating almost every phase of the Union's work—the immense share it has had in the scientific work and thought of our county. This indeed was admitted by many of the members of the Association.

The other portion of the Programme contains a clearly defined plan of the meeting rooms in the Guildhall, followed by full particulars as to all the Meetings, Excursions, Papers to be read, complete lists of all the members of the various Committees ; time tables of the trains to the near outside towns, with the fares ; with local information on every minute point one can conceive as likely to be of use to visitors to make for their convenience and comfort. Last, but not least, there are photographs of the Officers of the British Association, and all the local officers connected with the meeting, which, if all are as good as that of the Editor, will add largely to the interest of the Programme as a *Souvenir* of the Hull Meeting. It is sold by A. Brown & Sons, Ltd., Hull, price 1s., postage 3d.—G.T.P.

THE MAGLEMOSE.*

Long years ago—so long—none knows,
 There came a man from Maglemose.
 (How he got here without clothes,
 From Maglemose to Holdernose,
 Without the frost-bite in his toes,
 Is more than we can *dare* suppose).

This man a long bone harpoon throws
 (Just like those found at Maglemose) ;
 He aimed it at an elk (or deer),
 The harpoon pierced it like a spear ;
 It no doubt killed that elk (or deer),
 In what was once called Skipsea Mere.

From long ago, in silt (or clay),
 The harpoon and the elk did stay,
 'Til Mr. Morfitt passed one day,
 With iron rod to find his way.
 For fourteen feet it penetrated
 And then it stoppèd ; or so 'twas stated.

The rod touched something firm and bony,
 (So different from an object stony) ;
 Then Mr. Morfitt dug deep down
 For fourteen feet, and got renown
 By finding something quite unknown,
 (Except for one in Hornsea town).

How he dug, well, no one knows ;
 But he found trace of Maglemose !
 He put it in his small Museum,
 Where, with the other, all could see ' em.
 They rested there for years and years
 Until the British Ass. appears.

Then an Armstrong, long and weary,
 Gave a most enthralling theory :
 How the man from Maglemose,
 (In the Baltic, *that*, one knows)
 Came to Atwick (or quite close),
 While in search of food and clothes !

Then a Sheppard roared like thunder,
 ' There has been a fearful blunder,
 The harpoon from Maglemose,
 Is not old, as you'd suppose ' ;
 And in a manner most indecent,
 Said the harpoon was quite recent !

—: O :—

The Museums Journal for August contains Mr. E. E. Lowe's presidential address on (i) ' Romance in the Museum,' and (ii.) ' The Development of the Museums Association.' There is an account of the new Natural History Building, Glasgow University ; and ' The Problem of Provincial Galleries and Art Museums,' by Lawrence Haward.

* We take the liberty of reprinting this ' poem ' from *The Eastern Morning News*, Hull, which explains ' Lines written by a spectator at the recent discussion at the British Association.'

FIELD NOTES.

Pheasant Nesting in Spruce Fir.—This year a pheasant nested upon the remains of an old squirrel's drey in a spruce fir on the Clifton Castle estate near Masham. The position



Pheasant's Nest with 12 eggs in spruce fir, 22 feet from ground, near Harrogate, 1906.

From 'Birds of Yorkshire.'

R. Fortune, Photo.

is almost identical with the illustration by me in 'The Birds of Yorkshire' reproduced herewith.—R. FORTUNE.

Milax (=Amalia) gagates at Louth.—During the month of August I found amongst potato roots and broad beans in an allotment in Louth, several specimens of *Milax* (= *Amalia*) *gagates*. As far as I am aware this is the first record of this species for the Louth District.—C. S. CARTER, Louth, Sept. 2nd.

REVIEWS AND BOOK NOTICES.

How to Forecast the Weather, by **J. H. Elgie**. London : Holden & Hardingham, 144 pp., 1s. net. In this case the author knows what he is talking about, and gives a pleasantly written little book which will be profitable to peruse.

Rocks and Their Origins, by **G. A. J. Cole**. London : Cambridge University Press. 175 pp., 4s. net. We have pleasure in drawing attention to the fact that this handy little volume has reached its second edition. It is unnecessary to recommend anything written by that charming writer, Professor Grenville Cole.

T'ill an' T'oade uns upuv Greenho', by **H. J. L. Bruff**. York : T. A. J. Waddington, 108 pp., 3s. 6d... net. An admirable little volume of good dialect stories, which incidentally give considerable insight into the former manners and customs of the inhabitants of the village of Greenhow, which is between Nidderdale and Wharfedale.

Everybody's Book of Geology, by **E. G. Fenner**. London : Holden & Hardingham, 144 pp., 1s. net. Fortunately this book is very cheap, otherwise we could hardly recommend it. It might have been passable without the illustrations, which we understand have been drawn by the author from his own specimens. They are very poor indeed.

Sea and Shore Birds, and How to Identify Them, by **R. H. W. Hodges**. London : The Epworth Press, 64 pp., 1s. 6d. net. This little volume contains a wonderful series of illustrations of Auks, Terns, Gulls, Skuas, Waders, Geese, Ducks, Cormorants and Gannets, Petrels, and Divers, together with quite good descriptions and their plumage, nests, eggs, etc.

Heredity : in the Light of Recent Research, by **L. Doncaster**. London : Cambridge University Press. x.+163 pp., 4s. net. The fact that this volume has reached its third edition is sufficient to recommend it. The Cambridge Press has been particularly far-seeing in securing first-rate works of this kind. Our only regret is that the talented author is no longer with us.

Motoring in the North of England, by **C. G. Harper**. London : E. J. Burrow & Co., xxviii.+184 pp., 2s. net. This volume is issued under the auspices of the Royal Automobile Club and has been specially prepared to meet the requirements of the average tourist. It has several good illustrations from photographs, sketches, maps, and other information suitable for the motorist.

Through Yorkshire, by **Gordon Home**. London : Dent & Sons. x.+182 pp., 2s. net. We have long treasured some of Mr. Gordon Home's larger volumes dealing with the beauties of our county, and in the present book he seems to have brought together, by the aid of photograph and pencil, the best that the broad-acred shire can produce. The publishers have done their part well, and the volume is certainly one of the cheapest and best we know on the subject.

The World about Us : a Study in Geographical Environment, by **O. J. R. Howarth**. London : Clarendon Press, 94 pp., 2s. 6d. net. In this little volume the Secretary of the British Association gives some interesting geographical talks on original lines. In the eight chapters, after dealing with the Globe as a whole, he comes down to the district round Sevenoaks, which he knows so well, and concludes with 'what is the use of all this?' He also answers the question.

Naturalism in English Poetry, by **Stopford A. Brooke**. London : Dent & Sons, 254 pp., 1s. 9d. net. This charming little volume contains a series of lectures delivered by the Rev. Stopford Brooke at the University College, London, a little while ago. They will be exceedingly welcome in their present form. The chapters are headed : Dryden and Pope ; Young and Thomson ; Collins and Gray ; The French Revolution and the Poets who Preceded It ; Crabbe and Cowper ; Robert Burns ; Wordsworth, the Poet of Nature ; Wordsworth, Shelley, Byron ; The Poetry of Shelley.

NORTHERN NEWS.

In a species of Horatian Ode, entitled 'Modernity,' in a recent issue of *Punch* we read:—

'For savants undoubtedly British,
Who showed by their meeting at Hull
A talent for ways that are skittish,
A horror of all that is dull;
For medicos blandly coquetting
With French and his psychical pranks;
For Deans their decorum forgetting—
Oh! let us give thanks.'

Mr. Major Lawson has prepared a 'Descriptive Catalogue of the Old Bayle Gate and its contents, Bridlington,' (14 pp.).

The University of Leeds, in conjunction with the Leeds Philosophical and Literary Society, has issued a fine syllabus of Public Lectures.

The scheme for the erection of a new Museum and Art Gallery in the Botanic Gardens, Belfast, has been agreed to by the Belfast Corporation, and an expenditure of £80,000 'for the first fragment' has been authorised.

In a recent paper on 'Jurassic Plants from Ceylon,' Prof. A. C. Seward draws attention to the close similarity between the species from Ceylon and those found in the Jurassic rocks in Yorkshire, Graham Land, and other regions.

Parts XIV.-XV. of a 'Practical Handbook of British Birds' (Pages 449-624 of Vol. II.), edited by H. F. Witherby, has recently appeared and deals with the Grebes, Divers, Grouse, Plovers, Sandpipers, etc. There is the usual wealth of illustration, including some valuable plates showing Nestlings in Down.

Besides the reports of the officers and recorders, the *Fifty-first Annual Report and Proceedings of the Chester Society of Natural Science, Literature and Art* contains the address delivered at the Jubilee Meeting of the Society, on 'Charles Kingsley and the Chester Naturalists,' by Sir William A. Herdman, C.B.E., F.R.S.

Bulletin No. 6 of the Bureau of Bio-Technology contains papers on 'Micro-organisms in the Leather Trade'; 'The Detection and Estimation of Fluorides'; 'Study of the Causation of Ropiness in Worts and Beers'; 'Speckled Malt'; and a Note on "'Spued" Leathers.' The contributors are F. A. Mason, N. K. Smitt, P. Hampshire, F. Brown and J. S. Mitchell.

The Pickering Urban District Council has decided to place a room in the Memorial Hall for use as a museum, and we understand that Dr. J. L. Kirk has presented his fine collection of local 'by-gones,' etc. It seems a pity that this has not occurred a little earlier and thus have kept the fine collection of pre-historic remains formerly, on exhibition there, in the town. These are now at York.

At the concluding meeting of the British Association a party went from Hull to Leeds, where the honorary degree of Doctor of Science was conferred upon the following, by Professor A. Smithells, of the Leeds University:—Sir Charles Scott Sherrington, G.B.E., President of the British Association; the Duc de Broglie, Institut d'Optique, Paris; Dr. C. G. Petersen, director of the Danish Biological Station, Copenhagen; and Prof. P. Weiss, director of the Institut de Physique, University of Strasbourg.

Our American friends do not mince matters in connexion with their publications. We have recently received one or two pamphlets from a well-known Institution, with a postcard containing the following information:—'We are correcting and revising our mailing list. Please fill in above blanks, place stamp on other side and mail at once. *If this request is not complied with within 20 days, name will be stricken from list, and thereafter . . . Publications may be acquired by purchase only.* In the future, publications not received through failure to notify of change of address may be acquired by purchase only.'

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LONDON AND HULL: A. BROWN & SONS, LIMITED.

Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by
A. BROWN & SONS, Limited, at 5 Farringdon Avenue, in the City of London.
Nov., 1922.

THE NATURALIST.

A MONTHLY ILLUSTRATED JOURNAL
PRINCIPALLY FOR THE NORTH OF ENGLAND.

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RILEY FORTUNE, F.Z.S.

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A. BROWN & SONS, LIMITED, 5 FARRINGTON AVENUE, E.C. 4.
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NOTES AND COMMENTS.

FOSSIL HIPPOPOTAMUS, STARFISH AND INSECTS.

The Palaeontographical Society's Monograph contains three important Memoirs, diverse as to subjects, but each containing figures of north-country specimens. Dr. W. K. Spencer gives part V. of his 'Palæozoic Asterozoa'; Mr. Herbert Bolton Part II. (conclusion) of his 'Carboniferous Insects'; and Prof. S. H. Reynolds, Vol. III., Part I., of 'Pleistocene Mammalia,' this dealing with the Hippopotamus. In each case the plates and other illustrations are all that can be desired.

LIVERPOOL GEOLOGISTS.

The Proceedings of the Liverpool Geological Society for the Sixty-third Session (Vol. XIII., Pt. III.), edited by C. B. Travis, have recently appeared, and contain the Presidential Address of W. T. Walker, which deals with 'Geology in a Great Port.' There are also papers on 'The Natural Panning of Minerals in Littoral Deposits,' by N. W. Kennedy; 'Igneous Rocks of the Capel Curig District (North Wales),' by H. Williams; 'Peaty Bands in the Wallasey Sandhills,' by W. G. Travis; 'Some Fractured Pebbles from Point Cranstal, Isle of Man,' by W. A. Whitehead; and 'Bacteria from the Geological Aspect,' by R. G. Wills. There are several illustrations. The first copy of the Society's medal which has not been awarded posthumously has been given to Mr. William Hewitt, a frequent contributor to the Society's *Proceedings*.

—: o :—

FIELD NOTES.

BIRDS.

Wryneck at Scarborough.—A fine adult Wryneck was killed at Scarborough on September 9th. It is the first record to my knowledge for close upon thirty years. We have a specimen in the museum shot in Cayton Bay about that time ago.—W. J. CLARKE.

Scarcity of Corn Bunting in the Scarborough District.—I have seen one pair of Corn Bunting only in this district during the whole of the past season. Corn Buntings seem to have been decreasing in numbers for several years past, and at present have almost entirely deserted us.—T. N. ROBERTS.

Yellow Wagtail Nesting at Scarborough.—During the past summer a pair of Yellow Wagtails nested and succeeded in rearing three young ones in a garden off Seamer Road. The nest was built on the ground beneath a spring cauliflower plant, and contained five eggs. The Yellow Wagtail is a

regular visitor to the Scarborough district, and probably breeds occasionally, but this is the first record we possess of a nest having been found; the only other evidence of the species having nested with us being procured many years ago, when a pair of the birds was seen feeding young ones that had already left the nest.—T. N. ROBERTS.

White Carrion Crow at Buckden.—A White Carrion Crow is flying about in the neighbourhood of the village of Buckden in Upper Wharfedale. It is probably an albino. The gamekeeper says it is pure white all over, but on the half dozen occasions that I saw it, it appeared to be darker on the under wing coverts, though possibly this was due to the rather defective light at the time. The keeper says it has been about there for nearly three years, and that it is a female, and had a nest on the other side of the valley, just opposite to the village. The exceptionally heavy hailstorm they had there in May (which killed the monster Trout) probably saved the White Crow's life. She and her black mate were feeding young at the nest at that time, and the keeper was arranging to shoot them. But he never saw them return to the nest after the storm, and most likely the young birds had been killed by the huge hailstones.—H. B. BOOTH, Ben Rhydding.

—: o :—

ENTOMOLOGY.

Convolvulus Hawk Moth at Ilkley.—I recently received a specimen of a male *Sphinx convolvuli*, which had been taken flying about the shop of Mr. J. H. Kemp (Ilkley), about 8-15 on the evening of September 16th.—JO. BEANLAND.

Wensleydale Diptera, corrections and additions.—There are two errors in the list on p. 316. *Sciomyza griseola* Fal. should be *S. pallidiventris* Fal., and *Sapromyza obsoleta* Fal. should be *S. illota* Lw. These have been identified by Mr. J. E. Collin, who kindly examined them and other Acalypterates. He says that *Leria biseta* Lw. was previously unknown to him as British, and also that another fly I was unable to place, is *Heteromyza (Eurygnathomyia) opomyzina* Ztt. As far as he can trace this has only been taken twice previously, in Scandinavia. The wood where it was taken on East Witton Fell was cut down by Finns, and this may be one of their legacies. Another addition to our list he has is *Hilara beckeri* Strobl.—CHRIS. A. CHEETHAM.

—: o :—

MAMMALS.

Red and Fallow Deer: Lost Yorkshire Herds.—In 'A descriptive list of the Deer Parks and Paddocks of England'

by Joseph Whitaker, 1892, among the Yorkshire herds is the one at Red House, Nunmonkton, formerly owned by the Slingsby family. It then consisted of about 70 head, inhabiting a park of about 40 acres, surrounded by an oak paling fence. The average weight for bucks was 112 lbs., and for does 84 lbs. Upon the dispersal of the Slingsby estates, the deer were sold to a Harrogate gentlemen, who bought them for sporting purposes, *i.e.*, to shoot them 'on the spot.' They were purchased in July, 1916; at this time the herd consisted of about 50 head, and 14 were shot, when the remainder broke away through the fences and were lost in the surrounding country, being probably shot by farmers upon their lands. The farmers kept the matter very quiet as no further knowledge of them came to hand. The weights of the four largest of the deer shot, with skin and horns, but gutted, were 113 lbs., 94 lbs., 91 lbs. and 89 lbs. The same publication gives the Bolton Abbey herd of Red Deer at this date as numbering from 40 to 60 head. These deer were kept more in a state of nature than any others in Yorkshire. It is therefore with infinite regret that one has to record the destruction of this ancient herd, in 1921. The silent revolution which is now taking place in England is destroying natural features to a deplorable degree. One misses woods and coppices on every side. Old estates are changing hands, and old conditions favourable to the Naturalist are being swept rapidly away. As an instance of this regrettable state of things is the Kirby Hall estate, lately owned by Lord Knaresboro'. It was bought by an Agricultural company, which immediately felled the whole of the fine timber on the estate, making a beauty spot into an area of desolation, and now the old hall is being pulled down.—R. FORTUNE.

—: o :—

MOLLUSCA.

Succinea oblonga in Nidderdale.—A Pleistocene deposit has been found in Yorkshire, in which that rare and decadent species *Succinea oblonga* is quite plentiful. The batch of shells handed to me were obtained by Prof. Kendall and Mr. Fisher, of Leeds, in March, 1921, from a Pleistocene marly-soil cast up by moles in a low lying tract of land at Scriven, near Knaresboro'. Most of the specimens consisted of *Succinea oblonga*, hitherto only known in Yorkshire from a single shell found near York by Mr. Miller-Christy. They are of the form known as var. *elongata* Braun., and were associated with a few *Succinea elegans*, *Vallonia pulchella* and *excentrica*, *Hyalinia crystallina*, *Hygromia hispida*, *Pupa muscorum*, *Vertigo pygmaea*, *Zua lubrica*, etc.—JNO. W. TAYLOR, October 20th, 1922.

FLOWERING PLANT.

Calcicole Plants on Boulder Clay, etc.—In *The Naturalist* for October, p. 318, mention is made of limestone-loving plants on Boulder Clay. This, I presume, is because the latter is not entirely decalcified near the surface as it often is. In Ireland we have interesting facts of that sort, not always on Boulder Clay however; at Dog's Bay, Connemara, the famous foraminiferous strand sends its fine calcareous matter in dry windy weather up over the peaty area by which it is surrounded, and some calcicole plants are enabled therefore to live there, though the limestone area of West Galway is many miles away, beyond the great peat bogs. The Carline Thistle is plentiful along the Bay, and near it, on a peat bank, Mrs. R. Ll. Praeger some years ago found the rare Orchid *Neotinia intacta* growing as well as it would in a limestone area. At Rosapenna, on Sheephaven, in West Donegal, also a calcareous sandy area surrounded by deep peat for miles, an Orchid and other plants of a limestone area are found in abundance. Calcicole species, too, occur on little areas between the low cliff and banks and high-water mark north of Ardglass Harbour, County Down. Here the water, draining out from Glacial Gravels and Boulder Clay, containing a good many limestone pebbles and boulders, deposits its lime on the shore; the area for many miles around being a Silurian one with no limestone whatever except in the drift. On a cliff slope of Clare Island, Mayo Coast, Dr. R. Ll. Praeger pointed out to me the reverse—a peat-loving plant, the 'Mediterranean Heath,' growing in a stiff Boulder Clay, containing much calcareous matter from the Carboniferous Limestone area of Mayo.—R. J. WELCH.

————: o :————

Publication 85 of the Manchester Museum deals with West Indian Hepaticæ, is reprinted from *The Journal of Botany*, and sold at one shilling.

From the *Annual Report of the Bradford Historical and Antiquarian Society* we gather that the Society is in a flourishing condition, and that its membership is increasing.

The twenty-second volume of the new series of the *Transactions of the Cumberland and Westmorland Antiquarian and Archæological Society* speaks well for the activities of that society. The volume contains over five hundred pages, which, under the editorship of Messrs. W. G. and R. G. Collingwood, are all that can be desired. The printers, T. Wilson and Sons, have done their share well.

We have received the *Report for 1921 of the Botanical Society and Exchange Club of the British Isles*, by the Secretary, Dr. G. Clarice Druce (Vol. VI., Part III., pp. 265-546, 10s.), and, printed uniformly, the *Report for 1921 of the Botanical Exchange Club*, by Dr. E. N. Thomas, Miss Vachell, and A. E. Wade (Vol. VI., Pt. IV., pp. 547-587, 5s.). Each is crowded with valuable botanical information which should be consulted by all interested in the Flora of the British Isles. In addition there is a valuable 'Flora Zetlandica,' by Dr. Druce.

PLANT GALLS—THORNER TO COLLINGHAM.

 W. FALCONER, F.E.S.

MEMBERS of the Union interested in plant galls assembled at Thorner station on the morning of August 26th last for the second field meeting of the year. The direct route between the two places was not followed, deviations being made to take in the most suitable localities—rather a long walk, perhaps, but varied, altogether interesting and undertaken in the best of weather. The district was a favourite hunting ground of the writer close on thirty years ago; naturally in the interval many changes have taken place. On Scarcroft Hill the spinous form of *Ononis arvensis* (v. *horrida* Lange.) maintains its ground but *Picris hieracioides* has gone. *Parnassia palustris* and *Asperula cynanchica*, which were then abundant at Stubbing Moor, remain in greatly diminished numbers, but *Astragalus danicus* and *Antennaria dioica* appear to have died out. The bird's nest fungus also once occurred there. *Allium scorodoprasum* no longer grows in the old grassgrown occupation road leading to Wothersome lake—a strange fact seeing that it is so prolific in bulbils both below and on the head. On the other hand, *Thalictrum majus* (a) *flexuosum* Reich, of Lee's Flora, has spread considerably, not only there, but also in the bye-road leading to Compton Bank Top, as has also *Allium oleraceum* throughout the route. Scarce, or only occasional then, nothing was seen of either columbine or *Orchis pyramidalis* in Dalton Lane. *Matricaria suaveolens* is a rapidly spreading and abundant incomer into the district; *Linaria minor* and *Stachys arvensis* were noticed amongst the weeds of cultivation on waste ground by Holme Farm on this side of Stubbing Moor. The above sufficiently indicates the route taken and the succession of the places visited.

Summing up the results at the close of the day, 36 different species of plants had been found affected by 68 different forms of galls. Two of the latter were of outstanding importance. *Oligotrophus corni* Gir. has not previously been recorded from the North of England. Mr. Greevz Fysher was the first to notice elongated swellings on the leaf petioles of the aspens in the angle of the E. Rigton and Bramham roads. On dissecting and microscopically examining them at home, they were seen to contain one minute larva each, probably that of a very tiny moth, *Nepticula argyropeza* Zell., the county records of which, as given in Porritt's Yorkshire Lepidoptera, are Sheffield and York, 1879. A competent micro-lepidopterist would probably, as the galls were plentiful, easily obtain specimens of the moth in the neighbourhood. *Rhodites spinosissimae* Gir. is also new to the county; *Perrisia*

malphigii Kieff. and *P. acercrispans* Kieff. are second occurrences. *Andricus testaceipes* Htg., listed below, occurs plentifully in the Huddersfield district, but prolonged search on several occasions has not resulted in the discovery of the alternate generation, *A. sieboldi* Htg. Possibly it may have been so well concealed as to elude observation, but nevertheless the question suggests itself, "Do any of the parthenogenetic cynipidae sometimes, and in some districts, omit the agamous generation?" *Asterodiaspis quercicola* Bche. again turned up, but more sparsely. Evidently the 'pit maker' is more widely diffused in Yorkshire than one would anticipate, and would be found if properly looked for. *Eriophyes galii* Karp. is not mentioned anywhere as affecting crosswort in the same manner as it does goosegrass. Examples examined contained gall mites without any trace of aphides. Similar specimens were obtained at Cawthorn last year.

LIST.

BRACKEN.

DIP. *Anthomyia signata* Brschk. Occupation Road, Wothersome. W.P.W.

SPRUCE.

HOM. *Adelges abietis* Kalt. Near Collingham and on the Bramham Road, in Lendrick Hill Plantation.
A. strobilobius Kalt. Near Collingham. Plentiful also in Deffer Wood, Cawthorn.
A. (?) viridis Ratz. Growth of shoot unchecked and without the slightest bending at level of the gall; on the Bramham Road with first-named. W.P.W.

WILLOWS.

HYM. *Pontania proxima* Lepel. Thorner, *S. fragilis*; *S. caprea* and *cinerea*, Dalton Lane.
DIP. *Rhabdophaga terminalis* H. Löw. Bramham Road, *S. fragilis*; *Iteomyia capreae* Winn. and var. *major* Kieff, Dalton Lane, *S. caprea* and *cinerea*.
AC. *Eriophyes salicis* Nal. Scarcroft Hill and Dalton Lane, *S. caprea*.

ASPEN.

DIP. *Harmandia tremulae* Winn. In the angle of the Bramham and E. Rigton roads. W.F.
LEP. *Nepticula argyropeza* Zell. Swellings on the petiole just below the leaf. As the last. G.F. (see ante).

BIRCH.

DIP. *Massalongia rubra* Kieff. and *Contarinia betulina* Kieff. Dalton Lane.

ALDER.

AC. *Eriophyes nalepi* Fckn. and *E. laevis* Nal. Occupation road, Wothersome.

HAZEL.

AC. *E. avellanae* Nal. Big bud, Thorner and Dalton Lane.

OAK.

- HYM. *Andricus pilosus* Adlr. f. *secundator* Cam. Dalton Lane.
A. testaceipes Htg. Occupation road, Wothersome. W.F.
Biorrhiza pallida Oliv. As the last.
Neuroterus baccarum Linn. Old, on leaves, as the last.
N. baccarum f. *lenticularis* Oliv. Beginning, throughout the root.
Dryophanta divisa Htg. Wothersome and Dalton Lane.
A. ostreus Gir. Abundant throughout.
Cynips kollari Htg. Stubbing Moor, Occupation road, Wothersome and Dalton Lane—both last year's and this. In the second locality, one small bush supported 51, and its neighbour close on 40, and in the last a smaller bush, 60.
- DIP. *Macrodiplosis dryobia* F. Low and *M. volvens* Kieff. The Occupation road, Wothersome.
Perrisia malphigii Kieff. As the last. W.F. Previous Yorkshire record, Bardsey, near Leeds.
Cecidomyia (?) *spec.* Yellow larvæ deforming the acorns. Bagnall and Harrison. Occurs also in Saville Wood, Huddersfield.
- HOM. *Callipterus quercus* Kalt. Scarcroft Hill, Wothersome and Dalton Lane.
Asterodiaspis quercicola Bche. Occupation road, Wothersome. W.F.

BEECH.

- DIP. *Hartigolia annulipes* Htg. Dalton Lane.

NETTLE.

- DIP. *Perrisia urticae* Perr. Throughout the route, but not numerous.

DOCKS.

- HOM. *Aphis rumicis* Linn. Scarcroft Hill, and Dalton Lane.

GOOSEFOOT.

- HOM. *Aphis atriplicis* Linn. Scarcroft Hill, on *Chenopodium rubrum*.

BLACK CURRANT.

- HOM. *Aphis spec.* Leaf blistered, either *Myzus ribis* or *Rhopalosiphum ribis*, but insect gone: gardens on route.

BLACKTHORN.

- HOM. *Aphis spec.* Insect gone. More than one species galls this plant. General.

MEADOW SWEET.

- DIP. *Perrisia ulmariae* Bremi. Dalton Lane.
P. engstfeldii Rüb. Near Scarcroft Hill, W.F.

HAWTHORN.

- DIP. *P. crataegi* Winn. Common throughout.
 AC. *Eriophyes goniothorax* Nal. Stubbing Moor.

WILD ROSES.

- HYM. *Rhodites rosae* Linn. "Bedeguar." Scarcroft Hill, Stubbing Moor, E. Rigton Road, Dalton Lane, *R. canina* and *mollis*.
R. eglanteriae Htg. Scarcroft Hill, Wothersome, Dalton Lane.
R. spinosissima Gir. On *R. spinosissima*, Wothersome, approaching the lake. New to Yorkshire. W.P.W.
- DIP. *Perrisia rosarum* Hardy. Scarcroft Hill, Dalton Lane.

MEADOW VETCHLING.

DIP. *P. lathyricola* Rubs. Throughout the route.

Box.

HOM. *Psylla buxi* Linn. Collingham.

MAPLE.

DIP. *Perrisia acer crispans* Kieff. By the roadside, Thorner and Dalton Lane, W.F. The only other known Yorkshire station is Almondbury, near Huddersfield.

ST. JOHN'S WORT.

DIP. *P. serotina* Winn. *H. perforatum*, Occupation road, Wothersome. W.F.

DOGWOOD.

DIP. *Oligotrophus corni* Gir. Beyond Scarcroft Hill, a few on a small roadside bush. Dalton Lane, plentiful, W.F. Its first N. of England record.

SPINDLE TREE.

HOM. *Aphis euonymi* Fabr. Between the farm and Stubbing Moor. W.P.W., who has also noted it in Blind Lane, Bingley.

HOGWEED.

DIP. *Macrolabis corrugans* F. Low. Thorner and Wothersome.

ASH.

DIP. *Perrisia fraxinea* Kieff. Near Thorner station.

P. fraxini Kieff. Thorner and Dalton Lane.

HOM. *Psyllopsiis fraxini* Linn. Throughout the route.

GROUND IVY.

DIP. *Oligotrophus bursarius* Brmi. On the Bramham Road.

SPEEDWELL.

DIP. *Perrisia veronicae* Vallot. By the roadside, Thorner (Germander speedwell).

BEDSTRAWS.

DIP. *P. galiicola* F. Löw. *G. mollugo*, Dalton Lane, W.F.

AC. *Eriophyes galii* Karp. *G. cruciata*. Throughout the route (see page 326). *G. aparine*, Stubbing Moor, occupation road, Wothersome, and the Bramham Road.

GUELDER ROSE.

HOM. *Aphis viburni* Scop. Throughout the route, but not obtrusively abundant.

COLTSFOOT.

FUN. *Puccinia poarum* Nielson. Thorner.

DANDELION.

FUN. *Synchytrium taraxaci* De Bary. On Bramham road, near Lendrick Hill Plantation, W.F. Named by Mr. F. A. Mason.

RAGWORT.

DIP. *Phorbia seneciella* Meade. Stubbing Moor and Wothersome.

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Mr. O. G. S. Crawford (*Nature*, October 7th, p. 481), considers that one of the harpoons found in Holderness may be genuine. At the Hull Meeting of the British Association he said both were. We trust that he may shortly think that neither is!

WHERNSIDE IN RELATION TO MID-WEST (64) AND NORTH-WEST (65) YORKSHIRE.

W. H. BURRELL, F.L.S.

FORCE GILL, Greensett Moss, Great Blake Gill, Deepdale and other parts of Whernside have lately received attention from the Yorkshire Naturalists' Union, and in determining for which division of the county certain interesting plants should be recorded, it became necessary to consult the original statement of the lines of separation which Watson took to divide the larger counties into two or more vice-counties. The three county Floras and much local work are based on the Ridings, but the Watsonian vice-counties are officially recognised by the Yorkshire Naturalists' Union, and a short account of their inception may be of interest.

For the census of the comparative frequency of flowering plants, the British Islands were divided into eighteen provinces, described in Vol. I., *Cybele Britannica*, 1847; the need for smaller districts was acknowledged, the author stating that with increasing knowledge, the census would be founded on counties or smaller sections, but at the time that degree of exactness could not be reached; the work was completed in 1852, and in Vol. III. a second map was published, showing the further division of the British Islands into one hundred and twelve vice-counties, based upon county boundaries, but without a verbal description.

In Vol. IV. (1859), which was a summary of the first three volumes, a verbal description of the vice-counties was given, the Humber province being treated as follows:—
'The great county of York is first divided into two sub-provinces of East and West Humber by the Rivers Humber, Ouse and Wiske. South-East and North-East Yorkshire are then separated by the political line which divides the East Riding from the rest of the county, that part of the East Riding situate westward of the Ouse being taken as part of the Mid-West vice-county. South-West and Mid-West Yorkshire are separated by the Leeds and Liverpool Canal and by the Aire below Leeds. Mid-West and North-West Yorkshire are separated by the political boundary between the North and West Ridings; that boundary being deflected westward so as to pass over Whernside to the South-East angle of Westmorland in conformity with the watershed.'
In *Topographical Botany* (Second Edition, 1883), edited by J. G. Baker and W. W. Newbold, the author said (page xlii.):
'The lines of separation which are taken to divide the larger counties into two or more vice-counties cannot be sufficiently made out on the small map, and it may be useful to repeat

their description from the fourth volume of the original *Cybele Britannica*. . . . In thus dividing the counties, any natural peculiarities were taken such as watersheds, roads, canals, rivers, etc.' But in transcribing, he omitted the words 'in conformity with the watershed.' Whether accidental or intentional, this omission does not, I think, modify the boundary as defined in *Cybele*; the explicit statement that he was repeating the description from Vol. IV., that natural features were used when possible, and the statement elsewhere that drainage lines offered facilities for easy determination in the field, all point to this conclusion, and a reasonable interpretation of this westward deflection is, that all the waters flowing into Dentedale are in North-West, and the southward flowing waters are in Mid-West, Yorkshire.

Arnold Lees' treatment of the matter in *The Flora of West Yorkshire* (page 103) was good—'An artificial line carried westwards from Newby Head Inn along the summit of drainage over Bleamoor to the top of Gragreth.' A line along the summit of drainage should leave the political boundary at a somewhat higher altitude, say the 1750 ft. contour line on Wald Fell, but the introduction of so well known a spot as Newby Head focuses attention on the general position of the boundary, and sweeps away the lax thinking that Ingleborough, Penyghent, or even Settle are in Watson's North-West division. Messrs. A. Brown & Sons of Hull supply, in card form, a plan of Yorkshire showing the Watsonian divisions, with details of the boundaries. It should be noted that the Yorkshire Naturalists' Union's Dent meeting in May, 1921, covered this boundary' most of the records (*The Naturalist*, 1921, p. 273) belong to vice-county 65, but Greensett Moss and Force Gill drain southwards to the Greta; the gullery on the former and the mosses in the latter belong to Mid-West, vice-county 64.

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Part 36 of **Buckman's 'Type Ammonites'** contains 16 plates, one of which illustrates *A. capax* from the Oolites of Malton.

Guide to the University Botanic Garden, Cambridge, by **H. Gilbert-Carter**. The Cambridge Press, 1922, 3s. 6d. net. This volume, by the director of the garden, is an interesting and well-produced guide, and will be helpful, not only to the visitors to the garden, but also to the general reader. The sequence of families and genera is that of Engler's 'Syllabus,' and following the custom of zoologists, no capitals are used for trivial names. As the garden has long had a connection with oriental scholars, many eastern names of plants, also quotations illustrating the use of these names, are given. Many of these are translated, and will prove of much interest to the reader, but this method is very imperfectly carried out, and many unexplained names are introduced which will be quite meaningless to most users of the book. Prominent members of the University Staff have given assistance which is reflected to good effect in the volume where the more interesting biological features of the plants are described. There is a clear plan of the garden and twenty-four excellent illustrations from photographs.

BRYOLOGICAL NOTES ON COVERDALE AND BISHOPDALE.

CHRIS. A. CHEETHAM AND W. H. BURRELL.

Two recent visits to Coverdale and Bishopdale (June and August) have left the general impression that the latter has the richer moss flora. Allowance must be made for the fact that in Coverdale the time was spent in the lower, more open part of the dale, but even in so promising a place as Scrafton Gill the flora was disappointingly poor. Bishopdale, on the contrary, left a sensation of prodigality; its steep slopes and deeply cut gills, well planted with timber, provide the spray-washed rock and humid atmosphere favourable for mosses and liverworts; the stream in Back Gill falls eight hundred and fifty feet in less than a mile, and in Foss Gill six hundred and fifty feet in half a mile. A comparison of sections of the two dales, where the seven hundred feet contour-lines cut the streams, shows how much steeper are the slopes in Bishopdale, which is also more steeply cut at its upper end. This difference in shape, and the exposure of Mountain Limestone in the stream bed, probably influence the vegetation; not only was the rock flora more abundant and varied, but arboreal species were conspicuous; *Orthotrichum Lyellii* and *O. tenellum* were seen repeatedly. Dale Head Scar at 1,500 ft., and the series of wet limestones and shales exposed in the stream beds in the gills on both sides, had many interesting plants, and the rock strewn, timbered slopes of Back Gill and Foss Gill were to the Bryologist a paradise, that could not be seriously dealt with in so short a time. No attempt was made to form a complete list, but one hundred and fifty species were noted, from which the following were selected for the sake of extending their recorded distribution:—

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| <p><i>Andreaea petrophila</i>, grit rocks,
1,650 ft., Wasset Fell.</p> | <p><i>Bartramia Oederi</i>, Dale Head
Scar.</p> |
| <p><i>Seligeria pusilla</i>, Foss Gill and
Scrafton Gill.</p> | <p><i>Philonotis calcarea</i>, ♂ inf., Back
Gill, Bishopdale.</p> |
| <p><i>S. recurvata</i>, on gritstone, Walden-
dale.</p> | <p><i>Breutelia arcuata</i>, Back Gill,
Bishopdale.</p> |
| <p><i>S. tristicha</i>, Foss Gill, 1,000 ft.</p> | <p><i>Weberia cruda</i>, Dale Head Scar.</p> |
| <p><i>Rhacomitrium canescens</i>, Wasset
Fell, and frequent on grassy
fell roads in the district.</p> | <p><i>Plagiobryum Zierii</i>, Dale Head
Scar.</p> |
| <p><i>Weisia crispa</i>, riverside path,
Waldendale.</p> | <p><i>Mnium affine</i> var. <i>elatum</i>, Bishop-
dale and Coverdale.</p> |
| <p><i>Trichostomum tortuosum</i> var.
<i>fragilifolium</i>, Bishopdale.</p> | <p><i>M. serratum</i>, Scrafton Gill and
Back Gill.</p> |
| <p><i>Encalypta ciliata</i>, Dale Head Scar.</p> | <p><i>M. orthorrhynchum</i>, Scrafton Gill
and Back Gill.</p> |
| <p><i>Zygodon Mougeotii</i>, Dale Head Scar</p> | <p><i>M. stellare</i>, rocks by Kidstones
Beck, Bishopdale.</p> |
| <p><i>Amblyodon dealbatus</i>, Foss Gill,
1,000 ft.</p> | <p><i>Neckera pumila</i>, Foss Gill.</p> |

- Leucodon sciuroides*, plentiful on walls, Bishopdale.
Antitrichia curtipendula, plentiful in Bishopdale from Aysgarth to Newbiggin.
Myurella julacea, Dale Head Scar.
Thuidium delicatulum, shady rocks by Bishopdale Beck.
T. Philiberti, shady rocks by Bishopdale Beck.
Plagiothecium depressum, shady rocks by Bishopdale Beck.
Hypnum falcatum var. *virescens*, Back Gill.
Reboulia hemispherica, c.fr., Dale Head Scar.
Preissia quadrata, c.fr., Dale Head Scar.
Lophozia quinquedentata, Back Gill.
Ptilidium ciliare, Foss Gill and Wasset Fell.
Madotheca rivularis, Dale Head Scar.

TESTS OF WATER HARDNESS:—

- Scrafton Beck, below the village, 7°, Clark.
 River Cover at Coverham bridge, 10-11°.
 River Ure, at West Tanfield bridge, 13°.
 Bishopdale Beck, below Kidstones, 9°.

At 7 p.m. the same day, after ten hours heavy rain, when Bishopdale beck was estimated to have increased to six times its former volume, the hardness was reduced to 7°.

A gradual increase in hardness as the water travels downwards was shown during the same period by the Wharfe, which, after much rain, had 6-7° at Raisgill Hagg at 8 a.m., and 9-10° at Bolton bridge at 3 p.m. the same day. On a previous occasion in Nidderdale, during settled fine weather, How Stean beck showed 1-2°, Ravensgill beck 3°, The Nidd at Birstwith 3°, at Plompton 5-6°, at Cowthorpe 6-7°.

The disturbed state of the beds of the streams draining the north slopes of Buckden Pike arrested attention; rocks had been recently displaced on an unusually large scale, swept clear of aquatic vegetation, and in several places trees appeared to have been shifted bodily to midstream. A similar state of things was seen in Bouter Gill, Wharfedale, where the small beck had washed out its bed; the bridge carrying the Hubberholme-Oughtershaw road over it was blocked to within three feet of the crown of the arch; debris containing large boulders was thrown across the main river, and a bank of gravel estimated at 60 yards in length had been laid down on the right bank of the Wharfe, from which the West Riding County Council had removed a considerable weight of material into the adjoining field. It seemed probable that Buckden Pike was in the direct course of the May 21st storm which left its mark on the roads for many miles round.

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The death is announced of William Evans, M.B.O.U., one of the Editors of *The Scottish Naturalist*.

Owing to the cost of printing, the Council of the Ealing Scientific, etc., Society is unable to recommend the publication of the Society's Report and Transactions for this year.

ADDITIONS TO YORKSHIRE DIPTERA LIST.

CHRIS. A. CHEETHAM.

In the pages of *The Naturalist* during the year many species have been added to the Yorkshire List of Diptera; about twenty of them are due to the work of the Galls Committee, several will also be found in the reports of the Yorkshire Naturalists' Union's Excursions, and in other short notes.

The following list will bring the year's additions to slightly over a hundred. Thanks are again due to those who have kindly helped with difficult groups; a large proportion of this list is due to Mr. F. W. Edwards' interest in the Fungus gnats and Limnobiids; Mr. J. E. Collin has helped with the Pipunculids and Acalypterates; the type collection presented to the Yorkshire Naturalists' Union by Mr. P. H. Grimshaw has again solved many troubles. It is only possible by such generous help to deal with a large and difficult group like the Diptera.

- Sciara thomae* L. Mickley Woods, -/9/21, C.A.C.
Trichosia splendens Winn. Austwick, -/8/21. C.A.C., (F.W.E.).
Dynatosoma fuscicorne Mg. Crag Wood, 1/6/21, C.A.C. (F.W.E.).
Mycetophila fungorum Dz. (*punctata*). Crag Wood, 6/6/21, C.A.C. (F.W.E.).
M. rufescens Ztt. (*ornata* Stph.). Crag Wood, 6/6/21, C.A.C. (F.W.E.).
M. formosa Ldst. Crag Wood, 2/6/21, C.A.C. (F.W.E.).
Rhymosia domestica Mg. Austwick, 25/6/21, C.A.C. (F.W.E.).
Allodia grata Mg. Crag Wood, 7/5/21, C.A.C. (F.W.E.).
Phronia vitiosa Winn. (Dz.). Austwick, 4/6/21, C.A.C. (F.W.E.).
Coelosia flava Staeg. Crag Wood, 1/6/21, C.A.C. (F.W.E.).
C. tenella Ztt. (*flavicauda* Winn.). Austwick, 16/10/21, C.A.C. (F.W.E.).
Tetragoneura sylvatica Curt. Crag Wood, 6/6/21, C.A.C. (F.W.E.).
Mycomyia cinerascens Ztt. Nidd, 3/8/21; Austwick, 3/7/21, C.A.C. (F.W.E.).
M. incisurata Ztt. Austwick, 10/9/21, C.A.C. (F.W.E.).
M. winnertzi Dz. Austwick, 3/7/21, C.A.C. (F.W.E.).
M. affinis Staeg. (*flava* Winn.). Austwick, 10/9/21, C.A.C. (F.W.E.).
Platyura fasciata Ltr. (Mg.). Crag Wood, 28/6/21, C.A.C. (F.W.E.).
P. semirufa Mg. Farnley, 7/9/21, C.A.C. (F.W.E.).
Macrocera fasciata Mg. Austwick, 17/7/21, C.A.C. (F.W.E.).
M. centralis Mg. Crag Wood, 28/6/21, C.A.C. (F.W.E.).
Boletophila saundersii Curt. Crag Wood, 15/8/21, C.A.C. (F.W.E.).
Simulium reptans L. Pateley, 22/7/22, C.A.C.
Chironomus anthracinus Ztt. Chelker, this was listed as *C. moerens* Wlk. (*The Nat.*, 1921, p. 410). Mr. Edwards now considers it to be *anthracinus* Ztt., the Bramhope species is *moerens* Wlk.
Dicranomyia dumetorum Mg. Nidd, 2/8/22, C.A.C. (F.W.E.).
Molophilus corniger de Meij. Pateley, 7/8/20, C.A.C. Mr. Edwards says this is the first time he has seen a British specimen.
M. obscurus Mg. Austwick, 28/5/21, C.A.C. (F.W.E.).
Ormosia pentagonalis Lw. Bilsdale, 12/6/21, C.A.C. (F.W.E.).
Rhypholophus varius Mg. Austwick, 10/9/21, C.A.C. (F.W.E.).
Erioptera minor de Meij. Nidd, 2/8/21, C.A.C. (F.W.E.).
Lipsothrix errans Wlk. Austwick, 23/7/21, C.A.C. (F.W.E.).

- Ephelia submarmorata* Verr. Crag Wood, 8/7/20, C.A.C. (F.W.E.).
Idioptera (Ephelia) mundata Lw. (*militaria* Egg.). Austwick, 17/7/21,
 C.A.C. (F.W.E.).
Limmophila placida Mg. (*Crypteria carteri* Tonn.). Bilsdale, 12/6/21,
 C.A.C. (F.W.E.).
Cylindrotoma distinctissima Mg. Nidd, 1/9/31, C.A.C.
Ctenophora pectinicornis L. Miss M. Mellish, 6/6/22, Nidd.
Lasiopogon cinctus F. Allerthorpe, 7/5/21, W.J.F.
Epitriptus cingulatus F. Allerthorpe, 7/5/21, W.J.F.
Empis grisea Fal. Austwick, 17/7/20, C.A.C.
Sciadromia immaculata Hal. Whernside, 11/8/22, C.A.C.
Thamnodromia (Phyllodromia) vocatoria Fal. Pateley, 22/7/22, C.A.C.
Hercostomus nanus Mcq. Austwick, 23/7/21, C.A.C.
Gymnostomus celer Mg. Austwick, 10/7/20, C.A.C.
Syntomon monilis Wlk. Austwick, 16/7/21, C.A.C.
Campicnemus scambus F. Skipwith, 3/9/21, C.A.C.
Platypeza atra Mg. Wistow, 20/8/22, C.A.C.
P. infumata Hal. Ikley, G. Grace, -/8/22.
Pipunculus montium Bkr. Gormire, 13/6/21, C.A.C. (J.E.C.).
P. fuscipes Ztt. Farnley, C.A.C. (J.E.C.).
P. nigritulus Ztt. Spurn, C.A.C. (J.E.C.).*
Cnemodon vitripennis Mg. Crag Wood, 28/6/21, Nidd, 2/8/21, C.A.C.
Platyichirus tarsalis Schim. Bilsdale, 12/6/21, C.A.C.
Syrphus nigricornis Verr. Austwick, 24/5/19; Pateley, 6/8/20, C.A.C.
Psysocephala rufipes F. Allerthorpe, W.F.J.
Helomyza similis Mg. Nidd, 2/8/22, C.A.C.
Loxocera fulviventris Mg. Skipwith, 20/8/22, C.A.C.
Drosipunctum F. Farnley, 29/6/21, C.A.C.
Drosophila funebris F. Austwick, 22/10/21, C.A.C.
Chlorops nasuta Sch. Farnley, C.A.C.
Chloropisca notata Mg. Bingley, C.A.C.
Siphonella oscinina Fal. (*laevigata*). Skipwith, 20/8/22, C.A.C.

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Mr. John Murray has issued a cheaper edition of **Wild Life at the Land's End**, by **J. C. Tregarthen** (xii. + 236 pp., 7s. 6d. net), the first edition of which was published in 1904, and was well received. At its lower price our readers may care to have this fascinating story, with its fine illustrations of the haunts of wild birds, badgers, and men.

Messrs. Hodder & Stoughton have issued two interesting natural history volumes. The first, **Wild Life of the Weevil**, by **J. H. Fabre** (viii. + 278 pp., 8s. 6d. net), deals with the various species of Weevil usually met with, and their habits, and with the aid of the translator, Alexander Teixeira de Mattos, English readers are now made familiar with the numerous interesting episodes in the lives of these usually destructive pests. Among the species dealt with are Elephant Weevil, Nut-Weevil, Poplar-Weevil, Vine-Weevil, Sloe-Weevil, Pea-Weevil, Haricot-Weevil, Iris-Weevil, and many others. Their second volume is entitled **Oh, Shoot!** by **Rex Beach** (293 pp., 15s.). The book, in the author's own words, is 'a feeble effort to paint the optimistic soul of a sportsman, to show how impossible it is to prevent him from having a good time, no matter how his luck breaks, and, in a general way, to answer the question, Why is a hunter?' He deals with Geese, The Chronicle of a Chromatic Bear Hunt, The San Blas People, On the Trail of the Cowardly Cougar, Messing around in Mexico; and his very racy descriptions are illustrated by many photographs of natives, scenery, and different forms of animal life.

* Recorded previously as *geniculatus* Mg.

YORKSHIRE NATURALISTS IN BISHOPDALE.

W. H. PEARSALL, D.SC., AND F. A. MASON, F.R.M.S.

It has been due to no mere oversight that Bishopdale has not received earlier attention by the Yorkshire Naturalists' Union. The explanation lies in the lack of accommodation in this sparsely populated dale, and it is the latest tribute to the valuable services rendered by our Divisional Secretary, Mr. J. Hartshorn, to say that in the face of many difficulties he succeeded in arranging Headquarters at Newbiggin, in the very heart of the district to be investigated.

On Saturday, August 5th, the 302nd Excursion of the Union opened



Photo by]

[Harold Mason.

Foss Gill, Bishopdale.

by a visit to Kidstones Gill, through which runs the stream that forms the source of Bishopdale Beck. To the foot of the Gill, members were transported in batches by motor-car (through the kindness of Mr. Greevz Fysher), and the ascent was then commenced under the guidance of Messrs. Hartshorn and Cheetham. From the head of the Gill the descent was made by way of the moors, crossing Kidstones Pass, skirting Kidstones Scar and back to Newbiggin down Back Gill. It was a strenuous day, and much excellent work was done by all sections. Among the good things seen on this journey was a fine display of *Polymonium coeruleum* in its only North Riding station.

The following day saw members early afield in an ascent of Wasset Fell. Taking a path by the old lead mines under Knoutberry Hill (obviously misspelt 'Naughtberry' on the map), the moors were crossed into Waldendale, after which the course of Walden Beck was

followed down to West Burton. Rarely, in Yorkshire, does one see growing so luxuriantly, masses of pyramid orchis, spotted orchis and twayblade as were seen in the lower swampy hollows of Waldendale, and this sight alone was voted worth the journey.

The final excursion, to Foss Gill, was rendered difficult, and indeed curtailed, by rain. Undoubtedly, this Gill is one of the beauty spots of the Dales, although comparatively little known. Its series of waterfalls is particularly fine, one of them being almost of the magnitude of Hardraw Scour. Another is shown in the accompanying photograph, which conveys some idea of the beauty of this Gill. The geologists appeared to be particularly happy here, and a longer day could have been well filled.

The Excursion closed with a Meeting at Headquarters, under the Chairmanship of the President (Dr. T. W. Woodhead). Sectional Reports were read and votes of thanks were accorded to landowners who had given facilities for going over their estates, and to Mr. Hartshorn and our member, the Rev. W. K. Wyley, whose knowledge of the district proved an asset in the success of the Excursions.

GEOLOGY (W. S. Bisat).—The small gills at the side of the dale afford sections from the undivided limestone at the base up to the Middle Limestone, above which are partial exposures in the shales above the Middle Limestone, and fine scars of the Underset and Main Limestones. The best section in the lower beds is that of Foss Gill, other gills containing large quantities of boulder clay.

A band of septarian nodules in shales a few feet above the Middle Limestone was seen several times, and is probably constant over the area. The exterior of the nodules weathers deep red and makes this band noticeable. It is about on the horizon of Phillips' Impure Productus Limestone, and the shales adjoining are very fossiliferous. Search was made at this horizon for goniatites, but only one small specimen (belonging to the genus *Muensteroceras*) was noticed. Phillips records goniatites from the shales under the Upper Scar Limestones (Main and Underset) at Fountains Fell, and near Hawes ('Geology of the Mountain Limestone District,' pp. 48, 61, 185). He referred the specimens to *Goniatites sphericum* and *striatum*, which occur in Craven low down in the Bowland Shales, above the Pendleside Limestone. It is hoped that these goniatite-yielding beds in the Yoredale Series may again be located, and the goniatites compared with those of Craven.

BRYOLOGY.—The bryological flora of Bishopdale proved to be very interesting when contrasted with that of Coverdale, and a list of the more noteworthy species by Messrs. C. A. Cheetham and W. H. Burrell appears in this number of *The Naturalist*, together with some ecological observations and notes on water hardness.

MYCOLOGY.—The Mycological Committee was represented by Messrs. A. E. Peck, Greevz Fysher, J. Ackroyd and the writer. The latter remained in the district for a fortnight, and species collected during that time are included in the list. Prof. J. H. Priestley brought in a good number of species of both fungi and mycetozoa, and Mr. W. P. Winter collected specimens of Uredines and other parasitic fungi producing galls, or galled appearances, on plants, which are also included. There are no previous records of the fungi of Bishopdale.

One of the most interesting 'finds' was *Onygena equina* in abundance. It was first collected on old sheep's horn by Mr. Wyley, and it afterwards turned up several times on pieces of horn lying about on the moors.

The dominant tree in the dale is Ash, and on this the following species were observed.

On living trees:—

Pholiota squarrosa
Crepidotus mollis

Daldinia concentrica (Bolt.) Ces. et de Not.
Nectria ditissima Tul.

On fallen trunks and decaying stumps :—

<i>Lycoperdon pyriforme</i>	<i>Androsaceum rotula</i>
<i>Sphaerobolus stellatus</i>	<i>Poria sanguinolenta</i>
<i>Pluteus cervinus</i>	<i>Polystictus versicolor</i>
<i>Pholiota mutabilis</i>	<i>Irpex obliquus</i>
<i>Hypholoma sublateritium</i>	<i>Corticium laeve</i>
<i>H. fasciculare</i>	<i>Dacryomyces deliquescens</i>
<i>Mycena galericulata</i>	<i>Calocera viscosa</i>
<i>M. sanguinolenta</i>	<i>Daldinia concentrica</i> (Bolt.)
<i>M. tenerima</i>	Ces. et de Not.
<i>M. capillaris</i>	<i>Xylaria hypoxylon</i> (L.) Grev.
<i>Psathyrella disseminata</i>	<i>Mollisia cinerea</i> (Batsch.) Karst.
<i>Crepidotus mollis</i>	<i>M. melaleuca</i> (Fr.) Sacc.
	<i>Phoma samararum</i> Desm. (on fallen samaras).

In Kidstones Gill, Foss Gill and the smaller gills, all of which are planted with mixed conifers and deciduous trees (larch, spruce, Austrian pine, sycamore, ash, alder), and upon the intervening and surrounding grassy slopes, the following species were noted :—

<i>Lycoperdon giganteum</i>	<i>Boletus viscidus</i>
<i>L. perlata</i>	<i>B. elegans</i>
<i>Lepiota carcharias</i>	<i>Grandinia farinaceus</i>
<i>Psaliota arvensis</i>	<i>Stereum rugosum</i>
<i>P. xanthoderma</i>	<i>S. sanguinolentum</i>
<i>P. campestris</i>	<i>Corticium vagum</i>
<i>Amanitopsis vaginata</i>	<i>Peniophora hydnooides</i>
<i>A. fulva</i>	<i>Clavaria dissipabilis</i>
<i>Amanita rubescens</i>	<i>C. vermicularis</i>
<i>Arimillaria mellea</i>	<i>Calocera cornea</i>
<i>Stropharia aeruginosa</i>	<i>Ciliaria scutellata</i> (L.) Quel.
<i>S. semiglobata</i>	<i>Cheilymenia stercorea</i> (Pers.) Boud.
<i>Inocybe rimosa</i>	<i>C. coprinaria</i> (Cooke) Boud.
<i>Tricholoma terreum</i>	<i>Coprobola granulata</i> (Bull.) Boud.
<i>T. saponaceum</i>	<i>Ombrophila alniella</i> (Nyl.) Karst.
<i>Clitocybe odora</i>	<i>Coryne sarcooides</i> (Jacq.) Tul.
<i>C. infundibuliformis</i>	<i>Dasyphypha ciliaris</i> (Schrad.) Sacc.
<i>Hygrophorus virgineus</i>	<i>Erysiphe graminis</i> DC.
<i>H. ceraceus</i>	<i>E. Polygoni</i> DC.
<i>H. coccineus</i>	<i>Nectria cinnabarina</i> (Tode) Fr.
<i>H. miniatus</i>	<i>Hypocrea rufa</i> (Pers.) Fr.
<i>H. Reai</i>	<i>Pleospora herbarum</i> (Pers.) Rabh.
<i>H. psittacinus</i>	<i>Phyllachora Junci</i> Fuck.
<i>Collybia confluens</i>	<i>Phoma strobiligena</i> Desm.
<i>C. velutipes</i>	<i>P. conigena</i> Karst.
<i>Psilocybe semilanceata</i>	<i>Septoria Violae</i> Westend.
<i>P. foenicicii</i>	<i>S. Hederae</i> Desm.
<i>Mycena galericulata</i>	<i>Sepedonium chrysospermum</i>
<i>Nolanea pascua</i>	(Bull.) Fr.
<i>N. papillata</i>	<i>Botrytis cinerea</i> Pers.
<i>Omphalia maura</i>	<i>Penicillium expansum</i> (Link.)
<i>O. pyxidata</i>	Thom.
<i>Pleurotus corticalis</i>	<i>Tricothecium roseum</i> Link
<i>P. applicatus</i>	<i>Ramularia Plantaginea</i> Sacc.
<i>Russula ochroleuca</i>	<i>R. Taraxici</i> Karst.
<i>R. sub-foetens</i>	<i>Cystopus candidus</i> (Pers.) deBy
<i>Lactarius blennius</i>	<i>Peronospora parasitica</i> (Pers.) Tul.
<i>L. pyrogalus</i>	<i>P. Myosotidis</i> deBy
<i>Coprinus atramentarius</i>	<i>P. Schleideni</i> Unger.
<i>C. plicatilis</i>	<i>P. Polygoni</i> Thuem.
<i>C. Gibbsii</i>	<i>Plasmopara nivea</i> Schröt.
<i>Marasmius oreades</i>	<i>P. Epilobii</i> Schrot.

Androsaceum graminum
A. epiphyllum
Paxillus involutus

Pilobolus roridus Pers.
P. crystallinus (Wigg.) Tode
Spinellus fusiger Link

The Uredines were not common and in a locality like Bishopdale the range of species is necessarily limited. Those seen included the following :—

Uromyces alchemillae Lév.
A. Poae Rabenh.
U. Rumicis (Schum.) Wint.
Puccinia Poarum Niels.
P. pulverulenta Grev.

Puccinia Hypochoeridis Oud.
P. Acetosae (Schum.) Koern.
P. glumarum Ericks. and Henn.
Phragmidium mucronatum Schlecht.
Coleosporium Sonchi-arvensis Lév.
C. Tussilaginus Kleb.

The gall on Alder, due to *Frankiella Alni* (Wor.) Maire, collected by W. P. Winter, was fairly common on the roots of trees by Bishopdale Beck.

The nomenclature of the basidiomycetæ in the above lists is that followed by C. Rea, in 'British Basidiomycetæ.'

The following mycetoza were also collected :—

Ceratiomyxa fruticulosa (Mull.)
 Macbr.
Physarum viride (Bull.) Pers.
Fuligo septica (L.) Gmel.
F. muscorum Alb. and Schw.
Leocarpus fragilis (Dicks.) Rost.
Stemonitis fusca Roth.

Comatricha nigra (Pers.) Schröet.
Reticularia Lycoperdon Bull.
Lycogola epidendrum (L.) Fr.
Trichia varia Pers.
T. Botrytis Pers.
Arcyria nutans (Bull.) Grev.
A. pomiformis Rost.

VEGETATION OF BISHOPDALE (T. W. Woodhead).—This long, narrow valley, carved out of the Yoredales, well repaid the visit. The ill-drained pastures and meadows on the stream sides, with an abundance of rushes, thistles and meadow-sweet, are divided by fences of a miscellaneous type. The moss-covered walls, built of material from outcrops on the valley sides, or obtained from the boulder-clay strewn the surface, are freely interrupted by stake and rail fence, often overgrown with hazel to form a rough hedge. Hawthorn and holly are quite subordinate, and ash was the prevailing tree in these hedgerows. The hedgebanks were often clothed either with giant bellflower or a striking blend of harebell and red campion. Sweet cicely was abundant, and butterbur covered the newer banks. The valley sides, steep and grass-covered and fringed above by scars, are cut deeply by the streams of narrow gills. These are planted with trees, chiefly sycamore, common ash, elm, larch and alder, and in some also beech, pine, spruce and horse-chestnut. These narrow wooded gorges form a striking, though artificial feature in the landscape. A century ago much planting was done in the dale, and this was supplemented by further planting about forty years ago, and some fine trees were grown. The areas thus planted formed good preserves for game, especially pheasants, while the streams were well stocked with trout.

The fell sides are dominated by *Nardus stricta*, with *Aira flexuosa* and *Juncus squarrosus* sub-dominant. Other conspicuous species were *Anthoxanthum*, *Galium saxatile*, *Rumex Acetosella*, with dwarf, almost obscured *Vaccinium Myrtillus*. *Thymus Serpyllum*, *Trifolium repens*, *Achillaea Millifolium* and *Ranunculus repens* were also common. In the slacks *Juncus glaucus*, *Scirpus setaceus* and *Carex echinata* predominated, and in frequent rushy hollows were *Juncus conglomeratus*, *J. squarrosus*, *Galium saxatile* and *Potentilla Tormentilla*.

Ascending Wasset Fell grass heath gradually gave way to a Calluna heath with an abundance of *Aira flexuosa*, *Vaccinium Myrtillus*, *Empetrum*, and *Erica Tetralix*; with the daisy and wild thyme lining the grassy tracks. Higher still the heather moor merged into the Cotton-grass moss, with sundew among the sphagnum. On the summit at Naughtberry Hill, cloudberry and crowberry were abundant.

On the scars *Polemonium caeruleum* and *Asplenium viride* were seen,

and in the sheltered hollows frequented by sheep, the resulting lair flora included *Alchemilla vulgaris*, *Erophila verna*, *Arenaria serpyllifolia*, *Cerastium glomeratum*, *Prunella vulgaris*, *Urtica dioica*, *Veronica arvensis*, *V. Chamaedrys*, *Ranunculus repens*, *Sagina procumbens*, *Cnicus lanceolatus* and *Bellis perennis*. Descending into Waldendale is a good example of a pasture of *Juncus squarrosus* with a quite subordinate admixture of heath plants, e.g., bilberry, crowberry, waved hair grass, and also scented vernal grass. Similar pastures were seen in Bishopdale, with a considerable amount of *Holcus lanatus* and *Juncus articulatus*.

Two typical gills of the dale are Back Gill and Foss Gill. Both are narrow and cut deeply into the fell side, the lower parts are strewn with glacial debris which masks the beds below. Higher up, the stream falls in cascades over the harder calcareous beds, and these changes are reflected in the ground flora. Both gills are planted with the trees already mentioned, and on the scar top, at the head of Back Gill, is a plantation of elm and sycamore. At the head of this stream are a few scattered specimens of ash and elm, with mountain ash, alder, hawthorn and hazel, probably relics of the native flora. The more interesting species in Back Gill are *Geranium pratense*, *G. sylvaticum*, *Actaea spicata*, *Paris quadrifolia* and a good variety of ferns; oak, beech, male, lady, shield, hay-scented and common polypody; the bracken was infrequent.

Foss Gill, similarly planted, contains also the peduncled oak and much larch, spruce and pine. On a limestone outcrop on the side of the gill were seen the carline thistle, thyme, purging flax, eyebright, lady's mantle, wood sorrel, bird's foot trefoil, mouse-ear hawkweed, ribwort and red clover, along with ling, waved hair grass, mat grass, tormentil and bracken.

VERTEBRATE ZOOLOGY (W. G. Bramley).—The complete absence of ploughed land is no doubt accountable for the general absence of the grain-feeding birds, the Chaffinch being the outstanding exception. Thrushes, with the exception of the Ring Ousel, were very sparsely distributed, the latter being common at the head of the dales. Willow Warblers and Wood Warblers were abundant in the more wooded parts, but rain stopped a full investigation of the woods. The Grey Wagtail was in fair numbers; Swallows and House Martins numerous about the villages, Rooks and Jackdaws doubtless render useful service in destroying 'leatherjackets,' which are said to be very abundant in the meadows. A nest of the Sparrowhawk, probably containing young, was seen, and many bones, chiefly of birds, were found under the nest. Ringdoves were numerous, and one wonders what is the nature of their food in a purely pastoral country. Between Aysgarth and Redmire a few Redshanks were seen, and Curlews were plentiful on the fells. Stonechat, Goldcrest and Dipper were also observed.

A Stoat was found dead on Wassett Fell at a height of 1650 feet, and Weasels are very common on the moors. The Common Lizard was seen. The fishes of Bishopdale Beck are mainly Trout, with some Grayling which have been introduced.

MOLLUSCA (Greevz Fysher).—The moist condition of the district, which was greatly accentuated towards the close of the Meeting, was favourable for the observation of Mollusca. The following species and varieties were collected, and have been determined by Mr. John W. Taylor:—

Hyalinia lucida.

H. cellaria.

H. alliaris.

H. nitidula.

Helix nemoralis v. *libellula*.

H. hortensis v. *lutea* and v. *albescens*.

Helicigona arbustorum v. *trochoidalis*; v. *cincta*; v. *fuscescens*; and v. *flavescens*.

H. lapicida v. *nigrescens*.

Ancylus fluviatilis.

Clausilia bidentata.

C. cravenensis.

Clausilia laminata.

Hygromia hispida.

H. striolata v. *rubens.*

Ashfordia granulata.

Azeca tridens v. *nouletiana.*

Pyramidula rotundata.

P. rupestris v. *umbilicata.*

Zua lubrica.

Carychium minimum.

Ena obscura.

Pisidium amnicum.

Pupilla umbilicata juv. and adult.

P. pusillum.

Arion ater, *Agriolimax agrestis* and other slugs were observed.

Mr. Mason reports observing *Succinea putris*.

No Limnæidae except *Ancylus fluviatilis* were found in Bishopdale Beck or those tributaries examined.

DIPTERA—Bishopdale proved to be a good hunting ground for flies and a lengthy list of species collected by Chris. A. Cheetham on this occasion appeared in *The Naturalist* for October, pp. 315-316. Among more than 80 species unrecorded for V.C. 65, 9 were found to be additions to the county fauna.

PLANT GALLS (W. P. Winter).—The result of the collection of galls at the Newbiggin expedition was to add one to the county list. The comparative absence of oaks in the districts reached resulted in no oak galls being observed. The following were definitely noted. All fungus-galls were handed to Mr. Mason, and they are recorded in his lists.

ON BAY WILLOWS.—HYM. *Cryptocampus medullarius* Hartig.

ON GOAT WILLOW.—AC. *Eriophyes salicis* Nalepa.

ON ALDER.—AC. *Eriophyes brevitarisus* Focken., *E. laevis* Nalepa., *E. nalepai* Focken.

ON WYCH ELM.—HOM. *Schizoneura ulmi* Linn.

ON ELM.—HOM. *Schizoneura ulmi* Linn.; **Tetraneura ulmi* De Geer.
Handed in by F. A. Mason.

ON NETTLE.—DIP. *Perrisia urticae* Perris.

ON BLACKTHORN.—HOM. *Hyalopterus pruni* Fabr. AC. *Eriophyes similis* Nalepa.

ON MEADOW SWEET.—DIP. *Perrisia ulmariae* Brems.

ON *Rosa mollis*, SM., AND ON DOG ROSE.—HYM. *Rhodites eglanteriae* Hartig.

ON MOUNTAIN ASH.—HOM. *Aphis sorbi* Kalt. AC. *Eriophyes pyri* Pagenst.

ON HAWTHORN.—DIP. *Perrisia crataegi* Winn. AC. *Eriophyes goniothorax* Nal.

ON SYCAMORE.—AC. *Eriophyes macrorrhyncus* Nal.; *E. macrochelus* Nal.

ON ASH.—DIP. *Perrisia fraxini* Kieffer. HOM. *Psyllopsis fraxini* Linn.

ON GERMANDER SPEEDWELL.—DIP. *Perrisia veronicae* Vallot.

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Dr. A. S. Russell writes on 'The British Association Meeting,' in *Discovery* for November.

R. F. James writes on 'The New Forest in the Rain' in *The Entomologist's Record* for October.

The Journal of Roman Studies, recently issued, contains an account of a Decorative Bronze Silenus-mask from Ilkley.

'The Great Waxwing Invasion of 1921' is discussed by Dr. James Ritchie in *The Scottish Naturalist* for September.

The Geographical Magazine for November is almost entirely occupied by papers on Burma, Jamaica, and Traprain Law.

Abstracts of the various presidential addresses delivered at the Hull meeting of the British Association appear in *Nature*.

* New to county.

SPIDERS OF YORKSHIRE.

WM. FALCONER, F.E.S.

(Continued from page 332).

NEW TO THE COUNTY.

Fam. DRASSIDÆ. (*The Naturalist*, October, 1918).Gen. *Gnaphosa* Latr., 1-3.

G. anglica Camb. An uncommon spider, previously noted in Great Britain at a few places from the Channel Islands to Berwick—Bloxworth, (Dorset), Delamere Forest (Cheshire), Northumberland and Cumberland; abroad, France only. *Adult* June and July, ♀s also later. Beneath turves, dried cow dung, stones, etc., and amongst heather roots.

V.C. 61.—Allerthorpe Common, 2 adult females and a few immature males, August, 1919, T.S.; other females later.

Fam. ARGIOPIDÆ (*The Naturalist*, December, 1920).Gen. *Singa* C.L.K., 1-5.

S. pygmaea Sund. Has occurred in Dorset, Hants, Oxford, Berks., Essex, Warwick, Lancs., and in three Irish provinces, and Scotland. Widely distributed abroad from Christiania to the Mediterranean and in South Russia.

V.C. 61.—Allerthorpe Common, 1 ♀, June, 1920, T.S.

Fam. LYCOSIDÆ. (*The Naturalist*, May, 1922).Gen. *Pirata* Sund., 4-4.*P. piscatorius* Clerck.

A very rare British spider, previously noted in Dorset, Norfolk, Staffordshire and Lincolnshire, near Dumfries, and Co. Louth in Ireland; but with a very wide range on the Continent from Iceland, through north and central Europe to southern and eastern Russia; found amongst water weeds. *Adult*, May to July, ♀s also later.

V.C. 61.—Allerthorpe Common, 1 ♀, August, 1919, T.S.; others later.

NEW TO V.C. 61.

Theridion vittatum C.L.K. Allerthorpe Common, 1♀, T.S.*Ero cambridgii* Kulcz. Roos bog, first Yorkshire male, T.S., May, 1919.*Xysticus sabulosus* Hahn. Allerthorpe Common, one female, T.S., August, 1919.

NEW TO V.C. 62.

Theridion vittatum C. L. Koch.—Forge Valley, one male, T.S., June, 1919.

Epeira triguttata Fabr.—Gunnergate Woods, Cleveland, rare, J.W.H., *The Naturalist*, October, 1918, p. 317. It is not stated whether this is the aggregate *E. triguttata* Auctt., or one of its segregates, *E. triguttata* Fabr.—Jackson being the southern British species, and *E. sturmi* Hahn-Jackson, the northern, to the latter of which probably the above specimens should be referred, this view of their identity being further strengthened by their habitat-conifers.

Oxyptila praticola C. L. Koch.—Scattered localities at the base of the Cleveland hills between Broughton and Stokesley, a few females, J.W.H., *The Naturalist*, 1918, p. 316.

O. kochii Thor.—Forge Valley, one male, T.S.

NEW TO V.C. 63.

Epeira pyramidalis Clerck.—Wharncliffe, *Naturalist*, November, 1877, Vol. III., p. 59 and p. 61, sub. *E. scalaris*, S. L. Mosley.

NEW TO V.C. 64.

Lophocarenum nemorale Bl.—Austwick, C. A. Cheetham, both sexes.

NEW TO V.C. 65.

- Theridion sisyphium* Clerck.—Aysgarth, many both sexes.
T. pallens Bl.—Aysgarth; Jervaulx; Marske and Cogden. Not uncommon. *Phyllonethis lineata* Clerck.—Aysgarth; Tanfield.
Theonoe minutissima Camb.—Gunnarside (Swaledale), Mill Gill Force. Females at both places.
Pholcomma gibbum Westr.—Billy Bank's Wood, Richmond.
Ceratinella brevis Wid.—Not uncommon near Middleton in Teesdale, J.W.H., *The Naturalist*, October, 1918, p. 316.
Cnephalocotes obscurus Bl.—Mill Gill Force, both sexes.
C. elegans Camb.—Semmer Water, females.
Troxochrus hiemalis Bl.—Semmer Water and Cotter Force, females.
Minyriolus pusillus Wid.—Healaugh (Reeth); Semmerdale; females at both places. *Cornicularia cuspidata* Bl.—Gunnarside; Cotter Force.
Neriere rubens Bl.—Whitfield Foss.
Edothorax fuscus Bl.—Reeth. *Erigone atra* Bl.—Askrigg.
Maso sundevallii Westr.—Near Middleton in Teesdale, J.W.H., *The Naturalist*, October, 1918, p. 316.
Hilaira excisa Camb.—Deepdale, Y.N.U., Barnard Castle, W.E.L.W.; Cotter Force and Mill Gill Force, many females.
H. uncata Camb.—near Middleton in Teesdale, very rare, J.W.H., *The Naturalist*, October, 1918, p. 316.
Macrargus rufus Wid.—Wood at Healaugh (Reeth), female.
Oreonetides abnormis Bl.—Cotter Force and Mill Gill Force, both sexes.
Centromerus montana Bl.—Whitfield Force.
Centromeria bicolor Bl.—Healaugh (Reeth).
C. concinna Thor.—Gunnarside.
Agyneta cauta Camb.—Above Cotter Force, both sexes; Cogden (Reeth), one female.
A. decora Camb.—Aysgarth; Downholme Wood (Swaledale), females.
Leptyphantes obscurus Bl.—Aysgarth, female.
L. leprosus Ohl.—Billy Bank's Wood, Richmond, females.
Labulla thoracica Wid.—Gunnarside (Swaledale); Whitfield Force, females.
Linyphia pusilla Sund.—Cogden Gill, one female.
L. hortensis Sund.—Billy Bank's Wood, Richmond, females.
Nesticus cellulanus Clerck.—Billy Bank's Wood, Richmond, both sexes.
Epeira diademata Clerck.—Aysgarth.
Ero furcata Vill.—Near High Force, Teesdale; near Downholme Bridge, Swaledale, females.
Oxyptila trux Bl. Aysgarth, females.
Clubiona reclusa Camb.—Aysgarth; Cogden Gill (Reeth); several examples. *C. pallidula* Clerck.—Aysgarth Force, many females.
C. diversa Camb.—Buttertubs Pass; Semmerdale; both sexes.
C. comta C. L. Koch.—near Downholme Bridge, near Reeth, one male wandering; Aysgarth Force.
Anyphoena accentuata Walck.—Aysgarth Force, several females, adult and immature, beaten from trees and bushes.
Micaria pulicaria Sund.—Cogden Gill (Reeth), female.
Antistea elegans C. L. Koch.—In sphagnum, between Cotterdale and the Buttertubs Pass.
Lycosa lugubris Walck.—Middleton in Teesdale, abundant, J.W.H., *The Naturalist*, October, 1918, p. 316.
Neon reticulatus Bl.—Aysgarth Force, females.

ADDITIONAL RECORDS.

- Dictyna uncinata* Westr.—Cf., October, 1918.*
 V.C. 63.—Farnley, Leeds, W.P.W.; Winterset.

* Reference to the main list.

- Amaurobius ferox* Walck.
V.C. 61.—Hull, ♀, Swanland Hill, ♀s, T.S.
- Harpactes hombergii* Scop.
V.C. 63.—Hebden Bridge, D. Sutcliffe.
- Dysdera crocota* C. L. Koch.
V.C. 62.—Yarm, J.W.H. V.C. 64.—Selby, Messrs. Cheesman and
Musham.
- Segestria senoculata* Linn.
V.C. 65.—Arkengarthdale, Swaledale, both sexes.
- Prosthesima apricorum* L. Koch.
V.C. 62.—Hayburn Wyke, ♂, T.S. V.C. 64.—Grassington, ♀, R.B.
- Drassus troglodytes* C. L. Koch.
V.C. 61.—Allerthorpe Common.
V.C. 63.—Norland Moor, Halifax, ♀s.
- Theridion denticulatum* Walck.—Cf., November, 1918.
V.C. 65.—Whitfield Force, Askrigg; Downholme Wood, Swale-
dale.
- Theridion pictum* Hahn.
V.C. 64.—Carriage drive to Milner Field, Saltaire, W.P.W.
- Robertus lividus* Bl.
V.C. 65.—Wensleydale and Swaledale.
- Ceratinella brevipes* Westr.—Cf., January, 1919.
V.C. 61.—Kilnsea, T.S.
- Caledonia evansii* Camb.
V.C. 63.—Norland Moor, Halifax.
- Panamomops bicuspis* Camb.—Cf., April, 1919.
V.C. 61.—Saltend, T.S. V.C. 64.—Austwick, C. A. Cheetham.
- Savignia frontata* Bl.
V.C. 65.—Cotter Force.
- Diplocephalus cristatus* Bl.
V.C. 65.—Whitfield Force; Richmond.
- D. latifrons* Camb.
V.C. 65.—Cotter Force.
- D. beckii* Camb.
V.C. 63.—Crimsworth Dene.
- D. fuscipes* Bl.
V.C. 65.—Downholme Wood, Swaledale.
- Evansia merens* Camb.—Cf., August, 1919.
V.C. 63.—Goitstock, with *Myrmica ruginodes*, ♀, R.B.
V.C. 64.—Pike Lowe (Holmfirth) and Norland Common, Halifax.
- Enidia cornuta* Bl.—Cf., October, 1919.
V.C. 62.—Langdale End, T.S.
- Cornicularia vigilax* Bl.
V.C. 62.—Hayburn Wyke, ♀, T.S.
- Gongylidium rufipes* Sund.
V.C. 63.—Chellow Dene. V.C. 65.—Aysgarth.
- Ædothorax agrestis* Bl.
V.C. 62.—Forge Valley and Langdale End, T.S.
- Æ. retusus* Westr.
V.C. 65.—Wensleydale and Swaledale.
- Æ. gibbosus* or *tuberosus* Bl.
V.C. 65.—Fell above Cotter Force, ♀s, undistinguishable.
- Erigone arctica* White.—Cf., November, 1919.
V.C. 61.—Welwick and Hessle, T.S.
- Porrhomma pygmaeum* Bl.—Cf., December, 1919.
V.C. 61.—West Wood, Beverley, ♀, T.S.
- Tmeticus dentatus* Wid.
V.C. 61.—Allerthorpe Common, T.S., V.C. 62.—Forge Valley, T.S.
- Phaulothrix huthwaitii* Camb.
V.C. 63.—Northcliffe Wood, ♀, W.P.W.

- Microneta viaria* Bl.—Cf., January, 1920.
V.C. 65.—Richmond.
- Sintula cornigera* Bl.—Cf., Feb., 1920.
V.C. 62.—Hayburn Wyke, ♀, T. S.
- Bathyphantes concolor* Wid.
V.C. 65.—Swaledale.
- D. approximatus* Camb.
V.C. 64.—Eshton Tarn, ♂♀, W.P.W.
- Poecilometes globosa* Wid.—Cf., June, 1920.
V.C. 65.—Cogden Gill, Reeth.
- Leptyphantes alacris* Bl.
V.C. 62.—Various woods near Middlesbrough, J.W.H.
- Linyphia montana* Clerck.—Cf., September, 1920.
V.C. 65.—Aysgarth; Downholme Wood.
- Tapinopa longidens* Wid.—Cf., December, 1920.
V.C. 61.—Holme-on-Spalding Moor and Allerthorpe Common, T.S.
V.C. 62.—Holbeck Gardens, Scarborough.
- Tetragnatha extensa* Linn.
V.C. 62.—Yarm, Gunnergate, Broughton, J.W.H.
- T. solandrii* Scop.
V.C. 62.—Low Moor, Robin Hood Bay, T.S.
V.C. 65.—Downholme Wood, Swaledale.
- Pachygnatha degeerii* Sund.
V.C. 65.—Cogden Gill, Reeth.
- Meta merianae* Scop.
V.C. 65.—Gunnorside and Richmond.
- Epeira cornuta* Clerck.—Cf., February, 1921.
V.C. 63.—In a garden, Huddersfield, A. Clarke. V.C. 64.—Saltaire Park, W.P.W.
V.C. 65.—Downholme Wood.
- Xysticus cristatus* Clerck.—Cf. February, 1921.
V.C. 65.—Wensleydale and Swaledale.
- Oxyptila atomaria* Panz.—Cf., May, 1921.
V.C. 61.—Allerthorpe Common, ♂, Brantingham Dale, 1♀, T.S.
- Chiracanthium carnifex* Fabr.
V.C. 62.—Foulside, Robin Hood Bay, ♀, T.S.
- Clubiona pallidula* Clerck.—Cf. June, 1921.
V.C. 61.—Allerthorpe Common, T.S.
- Tetrax denticulata* Oliv.—Cf., September, 1921.
V.C. 65.—Downholme Wood.
- Cryphoeca silvicola* C. L. Koch.
V.C. 65.—Downholme Wood.
- Pisaura mirabilis* Clerck.—Cf., May, 1922.
V.C. 61.—Weedley, ♀, Allerthorpe Common, ♂, T.S.
V.C. 62.—Langdale, D. W. Bevan.
- Trochosa terricola* Thor.
V.C. 65.—Swaledale.
- Tarentula pulverulenta* Clerck.
V.C. 65.—Cogden Gill, Grinton.
- Lycosa amentata* and *L. pullata* Clerck.
V.C. 65.—Swaledale.
- L. herbigrada* Bl.
Low Moor Robin Hood Bay, ♀, T.S.
- L. palustris* Linn.
V.C. 63.—Cullingworth, W.P.W. V.C. 65.—Cogden Gill.
- Heliophanus flavipes* C. L. Koch.
V.C. 61.—Allerthorpe Common, ♂, T.S.
- Euophrys frontalis* Walck.
V.C. 63.—Sun Dean, Huddersfield, both sexes, but scarce, in one spot only.

YORKSHIRE NATURALISTS' UNION: ANNUAL MEETING OF BOTANICAL SECTION.

THE Annual Meeting of this Section was held in the Leeds University on Saturday afternoon and evening, October 7th. Professor J. H. Priestley, President of the Section, being in the chair. There was a good attendance.

Apologies for absence were sent on behalf of the Chairmen of the Plant Galls Committee, and of the Bryological Committee. Very feeling reference was made to the latter, Mr. William Ingham, B.A., who, it was announced, is seriously ill and unable to continue to act upon the committee with which he has been so long and honourably associated.

The report of the joint secretaries was read by Mr. J. Fraser Robinson, and showed that again, from all parts of Yorkshire, reports of the year's flowering and fruiting, new plant records and botanical work generally had been forthcoming, and were very encouraging. Workers in the field at Leeds, Bradford, Halifax, Sedbergh, Scarborough and Hull had given great facility to the Secretaries in making the general report by the fulness and exactitude of their individual efforts in this respect. In the discussion which preceded the adoption of the report, interesting observations on the luxuriance of the foliage and fruitage in successive seasons were made by Prof. Priestley, whilst Mr. A. A. Dallman called attention to the tendency to redness last Spring of the usually white Hawthorn blossoms. This, it was pointed out, was probably due to an excess of sugar in the sap of the hawthorn trees, after the long and fine summer of 1921.

Dr. W. H. Pearsall reported briefly for the Botanical Survey Committee, and referred to accounts of work done at Field Meetings, and already published in *The Naturalist*.

The Bryological report was read by Mr. W. H. Burrell, the great points of interest therein being the record for Mid-West Yorks. (V.C. 65) of the mosses, *Moerckia Flotowiana*, and an apparently 'galled' form of *Aulacomnium palustre*, which is not at all a usual phenomenon amongst mosses.

Mr. A. A. Dallman reported the discovery in Britain of a gall of the type of 'Witch's Broom' on the Willow; and showed two or three specimens to the meeting.

The officers of the Section for the coming year were nominated *en bloc*, as were also those of the committees, with the exception of the Chairman and Convener of the Bryological Committee, vacated by Mr. Ingham. Mr. W. H. Burrell was voted to the chair, and Mr. F. E. Milson to the convenership.

At this stage the meeting adjourned to afternoon tea, which had been very kindly prepared by Mrs. Priestley and other ladies, who were heartily thanked for their kind offices.

Dr. Pearsall read a paper on 'Plant Distribution and Basic Ratios,' having special reference to twelve or thirteen of the English lakes (Cumbrian), from which the lecturer showed some remarkable forms or varieties of *Potamogeton perfoliatus* which he had gathered, dried and mounted.

Mr. Roger Butcher, who first discovered *Tillaea aquatica* in Britain, gave an account, very fully illustrated by actual specimens, of aliens, fast vanishing or extinct plants, and recent additions to the flora of Yorkshire.

As some doubts had been raised as to the exact vice-county in which Mr. Burrell had made the 'finds' above referred to, he read notes on the exact boundary which should be accepted for the division of Vice County 65 from Vice County 64.

The meeting concluded with a paper from Prof. Priestley, who explained his work on the Physiological Anatomy of certain plants, an account of which has already appeared in *The Naturalist*.

It is intended to hold an indoor meeting of the Section in February next, and to have a Bryological week-end at Austwick next March.—J.F.R.

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MARINE BIOLOGY AT SCARBOROUGH.

DURING the week-end—September 22nd to 25th—the rocks and pools in South Bay, Scarborough, were explored by members of the Yorkshire Marine Biology Committee, two of the morning tides being most favourable for this purpose. An earlier date this year was impossible, as several members were occupied in the preparation of a marine exhibition in connexion with the Hull meetings of the British Association, and these meetings happened to coincide with particularly good spring tides which might have been more serviceable than those occurring a fortnight later. Those who were able to visit the exhibition in Hull probably did not think of the difficulties involved in procuring, transporting and keeping alive for fixed dates, delicate organisms taken fresh from the sea. Mr. Percival was in charge of the Committee's general section of marine animals, and he, for a week, managed to keep most of the creatures alive, in an atmosphere more or less inimical, by frequently renewing their baths of sea water. The sea water, upon which so much depended, was doubtless of the best quality, but, as it had been stored in 5 gallon TINS, it had acquired a ferruginous tint. In future, no more *canned* sea water please! Mr. Watson, of Sheffield, had a unique and splendid display of living tube-building worms brought together, at no little trouble and expense, from Yorkshire, Welsh, and South coasts; he was, fortunately, able to be present, and give demonstrations, but even he jibbed at using tinted sea water for his worms.

As a result of the Committee's investigations several additions have been made to the Yorkshire lists of marine fauna. Nudibranchs are increased by *Galvina farrani*, *G. picta*, *Facelina elegans*, *F. drummondii* (specially numerous in August and September in Scarborough pools), *Lamellidoris pusilla* and *Goniodoris castanea* (discovered on *Botryllus babius*). A new orange-coloured sponge, *Clathria seriata*, was found on a limestone block at Filey. Mr. Percival got *Spinther miniaceus*, a small yellow scale worm, apparently rare, at Robin Hood's Bay. Two or three specimens of *Thyanozoon brocchii*, a beautiful flat-worm with a pair of tentacles, were obtained at Scarborough. The only platyhelminths hitherto recorded being *Leptoplana tremellaris* and *Cycloporus papillosus* which were both in evidence this year. *Coryne fruticosa*, a hydrozoan, seems abundant at Scarborough, but has not been noted till now. *Tealia digitata* and *Sagartia ornata* are added to the list of anemones.

Actinoloba plumosa, the plumose anemone, known to fishermen as 'sea-paps'—a not inappropriate name for large forms seen dangling on harbour walls—was very much in evidence; unusual numbers of young forms, in various stages of growth, were accidentally discovered, between tides, on the under surface of a long ledge of grey limestone, hidden by masses of *fucus* which had to be turned aside. A pure white variety occupied one site, and a red, almost scarlet, variety was on another site on the same rock, with an interspace of about three feet. One of these red plumose anemones had two mouths, and a double disc girdled by one set of tentacles; it was under observation for five or six weeks, but showed no disposition to divide. The scarlet-fringed anemone, *Sagartia miniata*, continues to be prolific on the limestone rocks at the far end of Filey Brig. These rocks are all pitted, and in the pits appear (1) scarlet-fringed anemones; (2) red siphuncular ends of *Saxicavae*, and (3) the red papillæ of an occasional eolis, which simulate the tentacles of an anemone.

Egg-coils of the Sea Hare, *Aplysia punctata*, were found at Cayton

Bay in July, at Robin Hood's Bay in August, at Carnelian Bay and Scarborough early in September. Not far from their egg-coils the sea-hares were discovered, both at Robin Hood's Bay and at Scarborough, most of them bulky, measuring from five to six inches in length when extended. This is their first appearance on this coast since 1912, when shallow pools everywhere contained dozens of them, but of a much smaller size.

Lucernaria campanulata, which was so abundant in 1913, is still conspicuous by its absence. *Halicystus octoradiatus*, on the other hand, which predominated in 1913, reappeared in great numbers this year in June and July, and has since taken its departure.

Particular attention was directed to two beautiful tentacular worms, *Amphitrite johnstoni*, and the luminescent *Polycirrus aurantiacus*, owing to the great frequency of their occurrence in soft mud between layers of soft sandstone. Almost every block of sandstone turned over disclosed their presence.—A. I. BURNLEY.

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George Sheppard, Ph.D., writes on Coal-Mining by Steam-Shovel in Alberta, Canada, in *The Transactions of the Institution of Mining Engineers*, Vol. LXII., Part 5.

We learn from *The Museums Journal* that in spite of all protests the War Museum collections are to be removed to South Kensington where they will crowd out many of the existing examples in the Science Museum.

The Cleveland Technical Institute continues its useful monthly Bulletin containing abstracts of the most important scientific articles published bearing upon the particular subject in which its members are interested.

We got a shock on looking at the cover of *Man* the other day to find reference to a note on Two East Yorkshire Bronze Harpoons. We wondered what was coming next; but upon looking inside it was merely the 'Maglemose.'

The Antiquaries' Journal for October contains, among many other items, 'Notes on Early British Pottery,' by E. T. Leeds; 'The Age of Stonehenge,' by T. Rice Holmes; and 'Hallstatt Pottery from Eastbourne,' by Rev. W. Budgen.

The Entomologist's Monthly Magazine for November contains 'Observations on the Life-History of a Liotheid (Mallophaga) Parasite of the Curlew,' by James Waterston, and '*Drepanothrips reuteri* Uzel: an Addition to the British Fauna,' by R. S. Bagnall.

Dr. W. E. Collinge writes on 'The Economic Status of the Little Owl'; A. H. Patterson on 'The Natter-jack Toad'; 'The Crested Tit,' by N. Gilroy; 'Autumn Fungi,' by H. Garnett; and several shorter notes appear in *Natureland* for October.

In *The Entomologist* for November, Mr. W. G. Sheldon gives particulars of the Present Values of the Principal Works on the Palæarctic Lepidoptera, from his own experience as a collector. For some of the publications respecting which he is not quite definite with regard to prices, we would suggest that he would get reliable information from the lists issued by Wheldon and Wesley, Quaritch, and similar firms.

The recent numbers of the *Journal of the Linnean Society* contain the following papers: 'The Pollination of the British Primulas,' by M. Christy; *Spolia Runiana*: Summary of Results of Continuous Investigation of the Plankton of the Irish Sea during Fifteen Years,' by Sir William A. Herdman; 'The Heleoplankton of three Berkshire Pools,' by B. Millard; 'The Raninidæ: a Study in Carcinology,' by G. C. Bourne; 'The Theory of Recapitulation: a Critical Re-statement of the Biogenetic Law,' by W. Garstang; 'On the Terrestrial Isopod *Eluma coelatum* (Miers) = *purpurascens*, Budde-Lund, and 'On Two New Terrestrial Isopods from Madagascar,' by W. E. Collinge; and 'On the Mouth-parts of the Shore Crab,' by L. A. Borradaile.

POPULAR NATURAL HISTORY.

IF the number of books bearing upon popular natural history, recently issued, is any criterion, there must be a tremendous revival just now in connexion with the interest taken in natural science. From the house of Cassell has been issued **At Home with Wild Nature**, by **Richard Kearton** (xii.+164 pp., 7s. 6d. net), which it is perhaps unnecessary to state, is exceptionally well illustrated by Captain Cherry Kearton and the author. The illustrations consist of mammals, birds, reptiles, etc. The nature of the work of the brothers Kearton makes a long notice of this book unnecessary. The same firm publishes **Amid Snowy Wastes**, by **Seton Gordon** (xiv.+206 pp., 15s. net), and is an admirable description of the natural history and physical features of Spitsbergen. It is illustrated by numerous reproductions of photographs, as well as maps. The author was the official photographer to the Oxford University Expedition to Spitsbergen in 1921, and he does not so much give a report on the Expedition itself, as a record of his own personal experiences.

Wild Nature and Country Life, by 'A Woodman.' London: T. Fisher Unwin (159 pp., 6s. net). This book describes first-hand observations of various aspects of animal and plant life, by what may be described as a home-made Naturalist, and he gives the accounts of what he has seen in his own style. He wishes to remain anonymous, but his observations are certainly of scientific value, and have apparently principally been made by the side of the River Avon by a man whose occupation had been in connection with forestry. Of the chapters, the following half dozen give an idea of the nature of his work: The Haunt of the Otter, The Noctule's Haunt, The Nightingale's Haunt, Hedgerow Life, Nature by Night, A Springtime Ramble.

Messrs. Macmillan & Co. have published **The Sport of Bird Study**, by **Herbert K. Job** (xiii.+312+iv. pp., \$2.50 net), who is a member of the American Ornithologists' Union, and whose work will be interesting to British Bird lovers from the wealth of illustration which the author gives, enabling interesting comparisons to be made between the Avifauna of North-Eastern North America and Britain. The same house has issued a similar work, by the same author, entitled **How to Study Birds** (xiii.+272 pp., \$1.50), who states that the object of his book 'is to give, simply, clearly, and thoroughly, every possible suggestion and bit of practical information which may be useful to those who are beginning the fascinating study of birds in their native haunts.' Here again the numerous photographic illustrations and descriptions are of value. In this volume, special attention is devoted to camera equipment and use, Bird work for indoors, Bird study for schools, etc. Uniform with the last is **Man, The Animal**, by **Dr. W. M. Smallwood** (xiv.+223 pp., \$2.50), Professor of Comparative Anatomy in Syracuse University; also published by Macmillan and Co. According to the publisher's announcement, this book 'deals with life, the cell, reproduction, the nervous system, disease, and heredity. The author frankly sets forth the limits which scientific investigation has reached, at various points, and presents the biological view of life, disease, and death, with remarkable lucidity. It is a popular science of a sort that preachers, nurses, and social workers have long desired, and the general reader in America has not known where to find such a scientifically sound yet readable volume. Also it should be put in the hands of every college student.' It is certainly well illustrated by diagram and by reproductions from photographs.

Messrs. Thornton Butterworth have issued **Animal Curiosities**, by **W. S. Berridge**, an author already well-known in the scientific world. The volume deals chiefly with animals to be found in the Zoo, but these are classified under such heads as Fish and their Nests, Unnatural Natural History, Birds with Queer Beaks, and No Eyes and Multiple Eyes. The author deals with subjects not usually met with in popular works, namely, Squids, Cuttle-fish, Snails, etc. 252 pp., price 7s. 6d.

WEST YORKSHIRE BOTANICAL NOTES.

A. WILSON, SEDBERGH.

YORKSHIRE NORTH-WEST, V.C. 65.

- Ranunculus Lenormandi* F. Schultz. Very fine on the N.W. side of Baugh Fell, at 1900 feet, July, 1921.
- Aquilegia vulgaris* L. On scar limestone, foot of Garsdale.
- Cerastium vulgatum* L., var. *alpinum* Hartm. Blands Gill, Howgill.
- Ulex Gallii* Planch. Howgill near Sedbergh, sparingly (rare in V.C. 65).
- Rubus Chamæmorus* L. Near the summit of Great Dummacks at 2100 feet.
- Rubus Idæus* L. In good ripe fruit on Cautley Crag, at 1570 feet, Sept. 23rd, 1922.
- Potentilla Crantzii* Beck (= *P. alpestris* Hall). Yoredale Limestone scars, W. side of Deepdale at 1850 feet.
- Rosa spinosissima* L. Cautley Crag at 1550 feet, Sept, 1922.
- Saxifraga stellaris* L. Descending to 600 feet in Blands Gill, Howgill Fells. Also on Dent Crag, at 2100 feet.
- Saxifraga aizoides* L. Hobdale, Ashbeck Gill and other ravines of the Howgill Fells.
- Myriophyllum alterniflorum* DC. Pool on Holme Fell.
- Epilobium alsinifolium* L. Spring on Dent Crag below the gritstone rocks at 2000 ft. with *Saxifraga stellaris*.
- Apium inundatum* Reichb. Pond in the lower part of Howgill.
- Hedera Helix* L. Ascends to 1570 feet, on Cautley Crag.
- Lonicera Periclymenum* L. In fine flower at 1570 feet, on Cautley Crag, Sept. 23rd, 1922.
- Centunculus minimus* L. By a pond in the lower part of Howgill, Aug. 1921. New for V.C. 65.
- Digitalis purpurea* L. Ascends to 1600 feet or higher, on Cautley Crag.
- Veronica Beccabunga* L. Ascends to 2000 feet, on Dent Crag.
- Euphrasia Rostkoviana* Hayne. Grassy ground by the Lune, abundant.
- Galeopsis speciosa* Mill. Cultivated land, Sedbergh.
- Utricularia vulgaris* L. Frostrow Fell, in bog pools.
- Littorella uniflora* Aschers. Pool on Holme Fell.
- Polygonum minus* Huds. Pond in the lower part of Howgill. New for the Lune area.
- Malaxis paludosa* Sw. Seen in good flower on Aug. 30th, 1922, in the locality two miles from Sedbergh, where I found it in 1918. It does not appear to fruit here but, as is the case elsewhere, forms abundant gemmæ on the leaves. The plant is remarkable in forming green bulbils or winter buds at the base of the flowering axis, as is the case with many exotic orchids.
- Luzula sylvatica* Gaud. Ascends to 2000 feet on the Howgill Fells.
- Scirpus compressus* Pers. Bank of the Lune near Sedbergh.
- Carex rigida* Good. Summit plateau of Dent Crag at 2240 feet.
- Lycopodium alpinum* L. This with *L. Selago* L. form almost the only vegetation, and are exceedingly abundant, on extensive areas of stony ground about the summit of Dent Crag, at 2240 feet.
- Sphagnum medium* Limpr. Frostrow Fell.
- Polytrichum alpinum* L. Abundant on some parts of the Howgill Fells, as on the N.E. side of Arant Haw.
- Seligeria recurvata* B. & S. Frequent on the Coniston Grit (Upper Silurian) rocks of lower Dentdale and the Howgill Fells.
- Seligeria pusilla* B. & S. Limestone scars, W. side of Deepdale, and in Uldale, Baugh Fell.
- Rhabdoweisia denticulata* B. & S. Cautley Crag in various places.
- Blindia acuta* B. & S. Frequent on the Fells.

- Dichodontium pellucidum* Schp., var. *fagimontanum* Brid. Dent Crag at 2100 feet.
- Fissidens rufulus* B. & S. Rocks in the River Dee, Lower Dentdale.
- Fissidens osmundoides* Hedw. Blue Caster, Cautley; Combe Scar, Dentdale.
- Rhacomitrium protensum* Braun. Fine on Cautley Crag.
- Leptodontium flexifolium* Hampe. In fruit on Winder at 1400 feet, April, 1922.
- Weisia tenuis* C.M. On Coniston Limestone rocks by the Backstone Beck, Cautley. Fruiting.
- Weisia curvirostris* C.M., var. *scabra* Lindb. Dripping rocks of Basal Conglomerate by the Rawthey near Sedbergh, along with *Orthothecium rufescens* B. & S.
- Encalypta ciliata* Hoffm. W. side of Deepdale, on limestone rocks at 1900 feet.
- Zygodon lapponicus* B. & S. I reported this from upper Blands Gill in 1918 as a new county record. Since found in plenty on Cautley Crag.
- Zygodon conoideus* H. & T. On trees, Lower Dentdale.
- Physcomitrium pyriforme* Brid. Garden ground, Sedbergh, 1922.
- Webera cruda* Schwgr. Limestone scars, W. side of Deepdale, at 1900 feet. Also on Coniston Grit rocks, Cautley Crag, July, 1922.
- Plagiobryum Zierii* Lindb. W. side of Deepdale; Cautley Crag and Uldale. Fruiting in Ashbeck Gill, 1921.
- Bryum filiforme* Dicks. On White Fell and Great Dummacks at 1700 feet.
- Bryum Duvalii* Voit. In bogs in almost all the ravines of the Howgill Fells, from 1990 feet on Great Dummacks to as low as 900 feet in Blands Gill.
- Mnium subglobosum* B. & S. Winder and Baugh Fell.
- Hypnum vernicosum* Lindb. Foot of Dentdale; Baugh Fell.
The var. *majus* Lindb. W. side of Baugh Fell at 1500 feet.
- Hypnum scorpioides* L. Ascends to 1620 feet, on Great Dummacks.
- Hypnum giganteum* Schimp. Very fine in springs on Baugh Fell at 1500 feet.
- Riccia sorocarpa* Bisch. Roadside near Sedbergh.
- Metzgeria pubescens* Schrank. Garsdale and Uldale.
- Chiloscyphus polyanthos* Corda., var. *fragilis* K. Müll. Spring heads on Baugh Fell, etc.
- Fossombronia pusilla* L. Garden ground, Sedbergh.
- Blepharostoma trichophyllum* Dum. Blands Gill, creeping amongst *Zygodon lapponicus*; also on bank of the Lune near Sedbergh, mixed with *Zygodon Mougeotii*.
- Radula complanata* Dum. On trees, foot of Garsdale.
- Cololejeunea calcarea* Schiffn. Limestone rocks in Dove Cote Gill.
- Collema cheileum* Ach. Walls near Sedbergh.
- Peltigera aphthosa* Ach. Coska Gill, Baugh Fell, and bank of the Lune.
- Peltigera rufescens* Hoffm. Garsdale and Cautley Crag.
- Alectoria jubata* Nyl. Tree trunks, rare. On larch and oak, lower Garsdale, Dove Cote Gill, and Dentdale.
- Cetraria islandica* Ach., var. *tenuifolia* Wain. (=var. *crispa* Ach.). Summits of Dent Crag and Baugh Fell.
- Xanthoria lychnea* Th. Fr. Taith's Gill, Baugh Fell.
- Pertusaria lactea* Nyl. Arant Haw, Dentdale and Garsdale.
- Bilimbia sabuletorum* Branth. & Rostr. Wall near Sedbergh.

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Dr. F. A. Bather as delegate of the Museums Association gives an interesting report of the British Association meeting at Hull in *The Museums Journal* for November.

CORRESPONDENCE.

MUTILATED BEES BENEATH LIME TREES.

Some time ago I received several mutilated bees from the late J. W. Carter, of Bradford, which he had picked up beneath the blossoms of some lime trees in Patterdale, in the Lake District, all of which had neat holes in the thorax and abdomen, from which the contents had been removed. I thought at the time that some species of bird was the cause of this mutilation. The late James Varley, of Huddersfield, had recorded a similar phenomenon in *The Naturalist*, Vol. III., page 40. The bees in this case were sent to the late F. Smith, of the British Museum, and he suggested that probably the Red-backed Shrike, which seems to have a partiality for bees, was responsible for the mutilation. I am quite aware that the Great Tit has been known to be very destructive to the hive-bee, and perhaps other bees as well. Those sent by Mr. Carter were humble-bees—I think *Bombus lucorum*; and the holes in the thorax and abdomen were so very neatly drilled as to force one to the conclusion that it was the work of some species of insect. I met Mr. Fred Booth, of Saltaire, recently in Bingley Wood, and he informed me that some years ago he found the ground strewn with the dead bodies of bees beneath a lime tree in the Saltaire district, and on climbing the tree, he ascertained that wasps were the agents in these cases of the mischief. He further stated that the same lime tree or trees under which he had found the dead bees never flowered more freely than they did this year, but he never saw even one mutilated bee, and the same remarks are equally applicable to this district. It cannot be said to have been proved that all mutilated bees found under similar conditions to those named above have been caused by wasps. In some cases there are good reasons for believing that the mutilation is the work of ants, a few even asserting that sometimes it is the joint work of bees and ants. On Mr. Booth being asked whether he had ever observed any wasps attack bees before the latter had first become stupefied, he replied in the affirmative. Many observers, however, on the contrary, assert that in no instance have they ever seen wasps attack before stupefaction. I think such birds as Great Tits will eat hive-bees, if not humble-bees, as a whole.—E. P. BUTTERFIELD.

This question has been discussed repeatedly during the past fifty years. When I lived at Crosland Hall, twenty or more years ago, these mutilated bees were found in large numbers year after year on the ground under the branches of one of the flowering lime trees, but as at the time, I believed it had been proved that it was the work of Great and Blue Tits, or of wasps, I took no further interest in the matter. But surely the mystery could very easily be solved, if someone, on finding bees in such circumstances, would carefully watch for a short time, and so ascertain what the culprits really are.—G.T.P.

SAP OF FIR TREES ATTRACTIVE TO BEES.

During a few days of exceptional warmth and sunshine near Southfleet, Kent, I noticed considerable insect activity round some fir trees growing alongside the road at about 10 a.m. On approaching nearer I found a number of both humble and hive bees, with flies and other insects, feeding on an exudation which was oozing out of the fir leaves near where they join the wood-branch, and also to some extent from the soft recent wood growth. I do not remember noticing such a quantity of exudation in former summers; and the above in 1920 seemed to me as probably the result of sudden increased flow of sap owing to the sudden spell of hot weather following cold.

When returning in the late afternoon I found several bees on the road under the trees so intoxicated as to be helpless, and others in a

drowsy condition. Possibly owing to the previous cold weather, the bees, owing to shorter supplies of natural food than usual in summer, had not got sufficient honey to satisfy them, and therefore over-ate of this exudation from the fir trees.

Whether the bees recovered I cannot say. During 1921, a hot dry summer, and 1922 a cold wet one, I did not observe any analogous scenes.—R. J. WELCH.

Apparently the exuding sap of the fir trees had the same stupifying effect on the bees that 'sugar' has on moths, and there is little doubt they would recover very soon after falling to the ground from the trees, and in all probability the same bees would be again imbibing the sap at the fir trees early next morning. I do not remember to have seen bees at 'sugar,' but wasps are constant visitors to it—as are also hornets where they occur,—and evidently they are still on the wing much later in the day than are bees. Early in October I sugared a few posts about my garden when it was almost dark, and on going with the lamp to examine them after it had become quite dark, I found four wasps at the sugar, two of them on one post; indeed, that night there were almost as many wasps as there were moths.—G.T.P.

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Prof. Sir Arthur Keith suggests in the press that Darwin's home at Down should be secured and preserved as a Museum.

We much regret to hear of the death of Dr. Herbert Langton, M.B.O.U., for many years Chairman of the Museums Committee at Brighton, and for the past twelve years Treasurer of the Museums Association.

A recent account of the Birds in the York Museum given in the press draws attention to the important species in the collection, though no reference is made to the two specimens of the Great Auk which that Museum possesses.

The Hull Old Boys' Natural History Club has been founded in Hull and has issued a syllabus of lectures and excursions. The meetings are held in one of the Hull schools, and the subscription is 1/- . The President and Secretary is Mr. T. Stainforth.

J. G. Rhynehart writes on 'The Life-History and Bionomics of the Flax Flea-Beetle (*Longitarsus parvulus* Payk.) with Descriptions of the hitherto unknown Larval and Pupal Stages'; and H. A. Lafferty and G. H. Pethybridge describe 'A Phytophthora Parasitic on Apples which has both Amphigynous and Paragynous Antheridia; and on Allied species which show the same phenomenon,' in *The Scientific Proceedings of the Royal Dublin Society*.

Mr. T. A. Dymes sends a reprint of his analysis of the seeds of British Dactylorhizids, from the Botanical Exchange Club Report. He has carefully examined the ripe seeds of the forms of *O. maculata* and concludes that the seeds of *O. incarnata* differ from those of the Spotted Orchis in colour, shape, size, and in details of both testa and kernel. *Orchis latifolia* is a 'controversial conundrum'; he has examined seeds from several different places, 'but can make nothing of them.'

Our American friends still hold the record for 'system.' The following is copy of a printed card recently received:—LOST, STRAYED OR SHELVED—One Manuscript, with Unmounted Photographs, entitled This mss. was mailed you, postage prepaid and envelope enclosed for return, some months ago. If you've used it, *won't you send us a copy?* If you returned it and it failed to reach us, or if it should have failed to reach you, *won't you kindly let us know right on this card*—which we'd so much like returned? Possibly you were an humble contributor once. If so, you may recall how hard it was to bring the stray effusions back. Let us hear from you, *with this card*, at any rate, and we'll thank you ever so much!

CLASSIFIED INDEX.

COMPILED BY W. E. L. WATTAM.

It is not an index in the strictest sense of that term, but it is a classified summary of the contents of the volume, arranged so as to be of assistance to active scientific investigators; the actual titles of papers not always being regarded so much as the essential nature of their contents.

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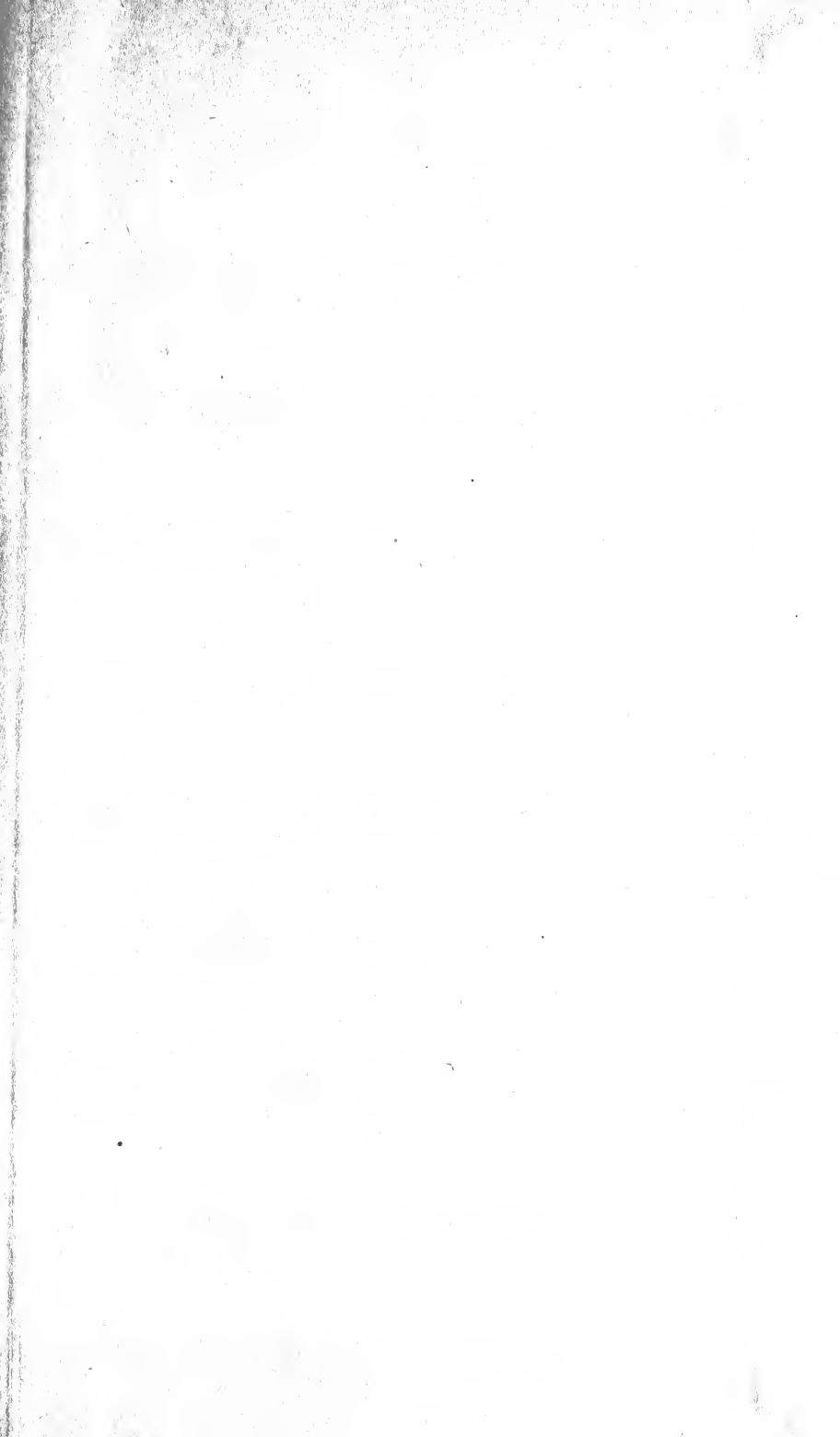
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Printed at BROWNS' SAVILE PRESS, 40 George Street, Hull, and published by
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